INSIDE THE OUTLINE:

UNDERSTANDING INCLUSIVE AND EXCLUSIVE IDENTITY IN MARAPIKURRINYA (PORT HEDLAND) ROCK ART

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This thesis is presented for the degree of Doctor of Philosophy of The University of Western Australia

Centre for Rock Art Research + Management, Archaeology, School of Social Sciences

2017
DECLARATION

I, Sam Harper, certify that:

This thesis has been substantially accomplished during enrolment in the degree.

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The following approvals were obtained prior to commencing the relevant work described in this thesis: University of Western Australia Human Ethics Office of Research Enterprise (RA/4/1/6418).

During candidature, this thesis was support by an Australian Postgraduate Award, and UWA Top-up scholarship.

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This thesis contains published work and work prepared for publication, some of which has been co-authored.

Signature:

Date: 27 October, 2017
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ABSTRACT

This thesis examines the Marapikurrinya (Port Hedland) engraved rock art province, using style as a proxy to examine group identity. These engravings are contextualised within their broader archaeological context, using additional sources such as ethnography, mythological narrative and material culture. By looking at these strands of evidence, social and cultural information is analysed alongside environmental and economic information within an archaeological framework.

The unique geology of the Marapikurrinya harbour and adjacent landscapes limits the physical extent of the Marapikurrinya rock art province. Additionally, this analysis considers the significant changes to this landscape from the Pleistocene and Holocene, particularly the impacts of rising sea levels. While Marapikurrinya may currently exist as a fertile coastal hub, this is a Holocene landscape that has changed significantly throughout human occupation in this region.

Classification of a Marapikurrinya rock art style follows Frederick McCarthy’s (1962) proposed stylistic and temporal sequence of Marapikurrinya rock art. Coastal and hinterland coalescence and fissioning will be explored to contextualise this particular rock art province within the heterogeneous engraved art provinces in the Pilbara. This research will display both the unique localised identity being represented here, and how this art and activity fits within complex social networks across the northwest of Australia.

There are three sequential styles (Outline/Patterned Figurative, Linear Schematised and Infill Naturalistic), which focus on different themes through time. Additionally, it will be shown that there are persistent motifs outside of these style groups that are not temporally bound.

Across these three styles two major graphic vocabularies are represented:

- a predominantly track and geometric motif assemblage that was termed 'Panaramitee' (Maynard 1977), now commonly referred to as the 'arid zone track and geometric style' (McDonald and Veth 2010) and which is dominant amongst the more recent linear and infill styles; and,
- a distinct localised coastal repertoire with unique stylistic choices displayed. Anthropomorphs, marine fauna and material culture deploy this vocabulary within an older outline style.

It will be argued that this change in focus relates to a shift from local to regional identity-signalling behaviour by the social group creating this rock art. The arid zone repertoire...
comprises the bulk of the rock art assemblage, representing access by the larger social group and potentially neighbouring groups to this region. The figurative styles represent local group identifying behaviour, which conveys more bounded group signalling.

This research mobilises the Marapikurrinya rock art as an active and agentive medium through which people manage social and environmental change. This rock art is linked temporally to sea-level stabilisation in the region during the mid-Holocene, and consequent social reorganisation, as demonstrated through changes in style and content.
AUTHORSHIP DECLARATION: CO-AUTHORED PUBLICATIONS

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I, Jo McDonald, certify that the student statements regarding their contribution to each of the works listed above are correct.

Coordinating supervisor signature:

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INTRODUCTION: OVERVIEW AND AIMS

*Marapikurrinya,* that’s our name for Port Hedland. You got five creeks here, it’s also the name of a family group that our father passes onto us, to all the family, me and my kids and we’re still part of the Marapikurrinya clan group. There’s a place where the fresh water is flowing into the salt water, drawing into one big yinda, freshwater flowing in to make those creeks, that’s the yinda now. That’s a place where water always is, people could always drink fresh water and it’s where the rainbow serpents lay.

Kerry Robinson, 2012

OVERVIEW

The Marapikurrinya (Port Hedland: Figure 1) rock art repertoire presents a body of engravings (‘petroglyphs’) is argued here to have to have both a distinctive, localised style, and a broader signalling repertoire that demonstrates links to surrounding Pilbara locales, and with engraved art throughout Australia. Early research (Clement 1903; Curr 1886; Radcliffe-Brown 1913; Richardson 1886; Withnell 1901) identified the Marapikurrinya rock art as extensive and stylistically unique. However, little academic research has been undertaken to define this body of engravings following McCarthy’s (1962, 1963) work in the 1960s, with the exception of Franklin’s overview (1984, 2004).

This thesis aims to define the Marapikurrinya style through identifying distinctive local rock art motifs, and explain how these contribute to a local style. Following this, local style is simultaneously considered within the context of the Pilbara, and broader Australian rock art regions. These different scales of comparison (Conkey 1978) are fundamental to exploring the production and presentation of group identity, and the ways that this may have changed through time.

The analytical approach used here combines multiple strands of evidence that can be used to portray group identity, and explores their congruence (or incongruence). Rock art will be examined using theories of style and agency to provide an argument for encoding of social and environmental information within motifs. Mythological narratives associated with the area, including several which have been linked to specific rock art motifs, will be presented as potential explanation and as part of a broader ritual behaviour inherent in group identity assertion, where rock art and language are linked signalling mediums. Linguistic markers, such
as cognate densities, nominal case morphology and neighbour intelligibility of Pilbara languages, will be addressed to aid understandings around cultural similarity and diversity within the region, and explore the movement of people and their languages through the landscape. In other words, the engravings will be studied as images not in isolation, but as an enduring symbolic component within a broader social context.

One of the issues of scale is the absence of temporal control over the engravings. It has long been assumed that the Marapikurrinya (Port Hedland) art repertoire is likely to be Holocene in age (and post sea-level rise).

I argue that the creation of these engravings falls within the last 7000 years, based on the following factors. This includes the relatively ‘soft’ nature of the oolitic calcarenite (which is the substrate), combined with the presence of a distinct marine figurative repertoire amongst the early art, contextualising the establishment of Marapikurrinya as a coastal locale post sea level rise.

Figure 1 Map of Western Australia with the Pilbara Bioregion and key sites

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rise. Historical linguistic analysis allows date ranges to be applied to linguistic markers and change, and following McConvell (1996) the last 6000 years in the Pilbara sees many interesting and distinct changes within these languages.

**Pilbara Language Groups and Rock Art Styles**

The questions explored in this thesis arose from previous research (McDonald and Veth 2008, 2013a; Wright 1968) which recognised the stylistic distinctiveness of Pilbara rock art provinces and which also recognised the potential for overlap with the distribution of Pilbara language groups (see Figure 2). This overlap is explored with rock art and language as two key and interacting practices through which people mark and negotiate identity. It is recognised that several Pilbara rock art locales potentially reflect significant diachronic indicators: i.e. a long time-depth of art production (e.g. Murujuga [the Dampier Archipelago], Depuch Island and Woodstock-Abydos/Upper Yule).

![Figure 2 Map of the Pilbara and Western Desert with major rock art sites (triangles), language groups and dialects (labelled), bioregions (thick lines), and major rivers. Source: Adapted from McDonald and Veth 2013; Tindale 1974](image)

The Pilbara language groups were developed with the establishment of the Pama-Nyungan languages across the majority of the Australian continent, subsequent to the Last Glacial Maximum (‘LGM’). The timing of these linguistic developments was identified by McConvell (1996) using linguistic stratigraphy and contextualised archaeologically by McDonald and Veth (2013a) and Veth (2000) as follows:
• 13,000-6000 BP: climatic amelioration across the Northwest;
  o Non-Pama Nyungan speakers;
  o Spread of people across the landscape post LGM with sea-level rise.
• 7000 BP: sea-level stabilisation and introduction of proto-Pama-Nyungan across Australia;
• 6000-1500 BP: increased territoriality predicted across the Pilbara:
  o Development of distinctive Pilbara rock art styles (See also Wright 1968);
  o c.4000 years ago Ngayarda subgroup established (Pilbara language bloc including: Mardudunera, Ngarluma-Kariyarra, Yindjibarndi-Kurrama, Panyjima, Jurruru, Njamal, Yinhawangka, Ngarla, Nhuwala and Palyku: See McConvell 1996; O’Grady et al. 1966);
• 1500 BP to present: Increased intensity of site occupation, ritual and ceremonial cycles, and long-distance exchange into the Western Desert:
  o Pilbara Culture Bloc established (McDonald and Veth 2013a);
• 200 BP Western Desert law spreads into the Pilbara prior to European contact (Tindale 1974).

McDonald and Veth have proposed that population dynamics, and changes in language, are closely linked to development of heterogeneous rock art styles across this relatively small arid zone area (McDonald and Veth 2013a; Veth 2000). Some of the rock art style provinces of the Pilbara correspond with identified linguistic and cultural (e.g. native title) boundaries, although others (such as Abydos-Woodstock, see McDonald and Veth 2013a) do not. Additionally, many mythological narratives can be traced across the Pilbara which intersect with rock art sites. These cross-cut the territories of different language groups, and have been interpreted within this context. These narratives include the Minyiburru, or Seven Sisters, and Two Men, which travel between the Pilbara coast and Western Desert (McDonald & Veth 2008, 2013; Palmer 1977; Tonkinson 1991). Several rock art traditions do not correlate with modern linguistic boundaries, as signalled by the localised Marapikurrinya repertoire within the broader and different style provinces across the Kariyarra language area’s hinterland (e.g. Tulleryanna Hill, Peeawah Hill, see Chapter 4).

The Marapikurrinya province falls within the Kariyarra cultural and linguistic bloc (Radcliffe-Brown 1913; Tindale 1940, 1974; Withnell 1901) and is found only on the calcarenite (limestone) outcrops located on the coast. This style does not cover the entire territory of the Kariyarra language speakers, nor is it found elsewhere in the Pilbara. The distribution of style appears to be geologically determined: the rock types located away from the coast are vastly different, and more durable. As a result, the techniques used to create the Marapikurrinya art
differ from the pecking styles used on the harder bedrock. This raises multiple questions about changes in culture and style through time, and for what purposes the Marapikurrinya calcarenite may have been marked with its own distinctive style.

The Marapikurrinya style is defined and compared with other Pilbara rock art styles, coastal provinces Murujuga and Depuch Island, and hinterland provinces including the Upper Yule. Exploring the homogeneity or heterogeneity of the Marapikurrinya rock art requires analysis of both internal variability and inter-regional comparison (see McDonald and Veth 2006; Smith 1989; Soffer 1987). Stylistic heterogeneity and homogeneity within rock art repertoires have been linked to open and closed societies respectively, and corresponding implications for trade and movement of people and culture (Conkey 1978; Frederick 2000; Gamble 1982; McDonald 1994; McDonald and Veth 2006, 2013a; Rosenfeld 1997; Smith 1992; Wobst 1977). Open social networks accommodate movement of people and resources with flexible borders and territories, where closed social networks restrict such movement. Factors involved in assessing the social information inherent in stylistic variability, include knowing the degree of environmental and resource stress and what affects this might have had on mobility. These issues and constraining the temporal framework are outlined in Chapters Two and Four.

A modified form of Information Exchange Theory (Wobst 1977, 1999), which predicts that relative stylistic homogeneity can be used to interpret the social information embedded in rock art, is used to assume intentionality in the rock art and to understand style as a vehicle for encoded identity information.

**ROCK ART AND MYTHOLOGICAL NARRATIVE**

The relationship between rock art, mythological narrative and other ritual (e.g. dance, song) appears to be meaningful, and this relationship has been argued to apply both the Western Desert and Pilbara rock art, particularly where engravings are considered to be the embodiment of Ancestral Beings (e.g. Palmer 1977; Tonkinson 1991). There is relatively little ethnographic information across the Pilbara, and much of this was collected within the last 100 years, significantly post-dating European contact (c. 1820s, settlement in the 1860s) and the social and geographic disruption that this brought. Information collected across the Pilbara in the twentieth century must be read against the grain within the context of serious impacts to traditional lifeways, including smallpox epidemics (Dench 1987), the effects of whaling, pearling and early gold mining industry, and the establishment of pastoralism (Paterson 2006). These factors affected traditional language groups’ territories and the social fabric of everyday existence. Marapikurrinya became a residential hub for many different language groups, and this continues into the current day (Palmer 1981). McCarthy (1962) notes that there were large
numbers of Njangamada speakers living around Marapikurrinya in the 1950s, bringing their language and stories, including their mythological narratives about culture heroes such as the Two Men (see Chapter 3) with them. These major social changes interrupted cultural practices, and instigated major change within social groups. These recent changes may be analogous with earlier episodes in Pilbara history, and resultant changes in rock art styles and mythological narratives. Whilst ethnographic analogy “has long been an object of uneasy mistrust among archaeologists” (Wylie 1985: 63), when used within a methodological structure that systematically tests multiple strands of evidence – such as archaeological, linguistic and ethnographic, a mutual enabling and constraining web of evidence and argumentation is enabled (cf. Wylie 1985).

One example that speaks to the inter-relationship between rock art, mythological narrative and memory is provided by Palmer’s (1981) research at Yandeearra station on the Abydos Plain, where an Aboriginal community formed in the 1950s following the Pilbara Strike. This new community included people from several surrounding Pilbara cultural and linguistic groups. Palmer provides an example of one of his informant inspecting an engraving site where he:

...began to sing a Dreaming song of an animal which he considered to be the subject of the rock art, the song being taken from the bundud tradition. My informant behaved in this manner because he believed that he had identified the spirituality of the petroglyphs as being Dreaming, and drew his knowledge from mythology to provide evidence of his possession of that knowledge (1981:228)

While inland Pilbara rock art was not part of the current Yandeearra community’s practice or tradition, it had been incorporated into an existing belief system, where the production of the rock art has been ascribed to mythological ancestors. This recursive use of rock art (Morphy 2012; McDonald and Veth 2013a), and its ability to be incorporated/reabsorbed into evolving belief systems, provides a cornerstone in the development of arguments developed in this thesis around rock art and group identity creation.

In the same way that rock art cannot be ‘read’ as if it were Western art history (see Chapter 4; and Tilley 1991, 2015), mythological narratives cannot be read in the same way as Western literature where each telling presents the same linear narrative. As Vinnicombe (2010) has argued, the nature of Aboriginal narratives is cyclical and non-fixed, or fluid and context and place-dependent.

Rock art is both permanent and fixed in the landscape, but its ongoing production through time, including the physical marking of the landscape, and how people receive and consume images
and places though time, creates a palimpsest of information. This information exists both within the engravings themselves, whose original meaning may never be known, and within living cultures who associate with these engravings. Rock art has an essentially iterative character reflecting cultural choice, and also directing it (Morphy 2012). Rock art, seen in this way both creates and confirms cultural practice: and as will be shown in this thesis, can both create and confirm group identity.

**RESEARCH QUESTIONS AND AIMS**

The central aim of this thesis is to identify how group identity has been created and portrayed in the Marapikurrinya rock art assemblage. Using the broader archaeological and social, linguistic and ethnographic contexts of these engravings, this research uses the engraved art to understand how different art styles are used in one place through time, and how this unique repertoire relates to other Pilbara rock art. The specific aims of this thesis are to:

1. Define the distinct Marapikurrinya art province, and examine how this compares with the broader Pilbara;
2. Identify possible chains of stylistic and cultural connection between Marapikurrinya and inland/arid Australia;
3. Contextualise rock art within a temporal framework exploring social/cultural and environmental markers; and,
4. Explore the congruence of rock art, linguistic markers, mythological narrative and material culture to understand relationships between these media, and their collective information potential.

**SIGNIFICANCE**

This research will provide new knowledge that contextualises and extends early research in Port Hedland (McCarthy 1962; Petri and Schulz 1951; Tindale 1987), and represents a new study of previously unrecorded rock art complexes and archaeological sites. The two site complexes investigated, South West Creek 4 and Mourambine Kariyarra 3, comprise approximately 10,000 engravings, as well as shell middens, grinding patches, portable lithic material, standing stones and stone arrangements. The size and complexity of these sites provides intriguing results that contradict some of the early conclusions about this repertoire, including sequencing and the characterisation of the repertoire in regional and national contexts.
This quantitative and qualitative analyses of the engravings go beyond the descriptive nature of early research. This includes innovative methodologies which has not previously been undertaken, including the use of Harris Matrices for superimposition analysis of engraved art.

This analysis forms part of contemporary rock art discourse, particularly around agentive function of rock art. This allows for increasingly sophisticated questions around use and function of rock art, founded on better integration of this medium with its archaeological and social context.
**Thesis Structure**

**Chapter one** provides the research and environmental background for Marapikurrinya, including a summary of previous research, historical impacts to the sites and area, and environmental change through time.

**Chapter two** explores the theoretical basis used to answer the research questions and aims of this thesis. This includes a discussion on theories of style, and the relevance of agency in defining group identity through rock art analysis.

**Chapter three** discusses the cultural context of northwest of Australia. It provides information on linguistics, mythological narratives and material culture for the Pilbara region. Linguistic analysis of rates of change (McConvell 1996) is used to support the movement of certain cultural practices (e.g. marriage systems, initiation rituals) between the Pilbara and Western Desert, allowing an interpretive framework for interpreting particular motif choices and content within the rock art. A summary of material culture, as relates to distinct rock art motifs, is provided. This chapter also explores the core mythological narrative of this research, the *Minyiburu* songline as recorded by Kingsley Palmer (1977), and how this relates to other ethnographically recorded stories and songlines for the area.

**Chapter four** provides an occupational model for the northwest and explores settlement patterns and movement of people in the Pilbara region. It outlines current knowledge about the rock art of the northwest of Australia and for Marapikurrinya specifically. Previous archaeological research in the region, including subsurface archaeology contextualises Marapikurrinya rock art within the broader Pilbara.

**Chapter five** details the methods used in undertaking this research, including the fieldwork undertaken, the technological aspects of collecting and recording the data and the analytical techniques used (including statistical programs). It also demonstrates how ethnographic and linguistic information and material culture has been incorporated into this archaeological analysis. Fred McCarthy’s (1962) rock art sequence is described and the hierarchical classification frameworks developed in this research, including motif choice, style, form and technique, are described.

**Chapter six** describes the analysis of synchronic variability in the Marapikurrinya rock art. The results focus on identified style(s) and key motif groups (e.g. Minyiburu, Murra Murra, marine fauna and patterned material culture). Motif choice, spatial and stylistic variations are presented as key themes. The Marapikurrinya style(s) are defined. This analysis provides the
basis for understanding different functions of the rock art and explores the identity information present.

Chapter seven provides the results of the diachronic analyses. Harris Matrices and superimpositions are used to develop a new chronology superseding McCarthy's (1962) sequence. Motif choice and spatial distribution are used to explore the stylistic variability within this assemblage.

Chapter eight presents the conclusions of this thesis. Marapikurrinya rock art style is placed within its broader Pilbara cultural context. The multiple identities within the rock art are presented, and congruence and incongruences demonstrated by the rock art, material culture, linguistic and narrative elements are summarised.
CHAPTER 1: MARAPIKURRINYA RESEARCH AND 
ENVIRONMENTAL CONTEXT

RESEARCH BACKGROUND

Marapikurrinya was selected as an ideal study area for several reasons. A lack of detailed regional integration of Pilbara rock art regions and styles was identified as a key research question for rock art studies in this region (McDonald and Veth 2013a). This research provides vital information as part of broader regional studies. Few rock art analyses have managed to integrate broader archaeological evidence with contextualised art bodies (exceptions include: e.g. David et al. 2011, 2013; McDonald 2008; McDonald and Berry 2017). This may reflect the difficulties in identifying good archaeological deposits in association with rock art, but also the historic division between rock art specialists and mainstream archaeological discourse. The Marapikurrinya archaeological profile in the region’s archaeological discourse is almost non-existent. Whilst there are numerous midden, chenier and other shell dates available within broader syntheses of the Abydos Coastal Plain (e.g. Clune and Harrison 2009; Sullivan et al. 2011; Zubieta and McDonald 2015); settlement and subsistence models for Marapikurrinya are poorly developed. This thesis addresses these gaps in regional rock art and Marapikurrinya specific Pilbara archaeological research.

While the archaeology of the region is poorly understood, the rock art of Marapikurrinya has been documented for over 100 years (Atkins 1990; Basedow 1918, 1925; Campbell 1911; Cleland and Giles 1909; Davidson 1952, 2011; Franklin 1989, 2004; McCarthy 1962; Mountford and Tonkinson 1969; Palmer 1975, 1977, 1981; Petri and Schulz 1951; Radcliffe-Brown 1913; Richardson 1886; Rose 1950; Tindale 1940, 1974, 1987; von Brandenstein 1970a, 1970b, 1972; Withnell 1901; Worms 1949, 1954; and Wright 1968, 1977). These studies will be discussed in detail in Chapter 4. Whilst Marapikurrinya has received more attention than many rock art locales across the Pilbara, it will be shown that these studies are largely descriptive and exploratory, with few detailed, analytical projects undertaken (i.e. McCarthy 1962; Petri and Schulz 1951; and Tindale 1987).

From McCarthy (1962), Petri and Schulz (1951) and Tindale’s (1987) research several accurate observations can be made: the engravings are located along the low relief outcropping calcarenite ridges on which the town was being built. A series of common motifs have been identified within the engraved repertoire and include: marine animals, such as stingray, turtles and more esoteric outline figures; distinctive anthropomorphs, such as the Minyiburu; and
material culture including shields and spearthrowers (Campbell 1911; Cleland and Giles 1909; Petri and Schulz 1951). Few researchers undertook ethnographic recording during their visits to Marapikurrinya, and those who did were mostly male and selected male informants from both local Kariyarra groups, and some who identified as other speaking other Pilbara languages including Ngarla and Nyangamarda (See McCarthy 1962; Petri and Schulz 1951 and Tindale 1987).

Petri and Schulz were quick to identify that part of the Woodstock-Abydos region of engravings fell within the (contact) Kariyarra cultural bloc. However, they noted the art in Marapikurrinya was distinctly different:

A comparison between the Woodstock-Abydos and Port Hedland [Marapikurrinya] sites, which it will be recalled, belong to the same tribe and culture area, give the impression that the engravings are the product of two quite different peoples, distinct in essence and culture. (1951:79)

McCarthy’s research in Marapikurrinya collated the engravings of three sites around the Marapikurrinya harbour. Using this and his later explorations of Depuch Island (1961) and the Sydney-Hawkesbury Basin (1958), he developed a pan-continental sequence for Australian engraved rock art. This sequence espoused a linear progression of styles, where the styles were partly based on engraving technique, but largely based on motif content and form. Whilst this sequence has largely been rejected as a coherent style sequence across Australia (e.g. Mulvaney 2013), it presents Marapikurrinya as an intriguing case study. In particular, infill track motifs – a style more commonly associated with ‘ancient’ Panaramitee or arid-zone track and geometric styles – are located as a recent style phase in the sequence, which is the converse of other published Australian rock art sequences (e.g. Clegg 1987; Maynard 1979).

Most recent Marapikurrinya rock art research has resulted from consulting archaeology projects, undertaken in association with proposed development in the region (e.g. AIC 2004; Chapple 2001; Eureka et al. 2007; Gavin Jackson 2008; Green et al. 2006; Lockyer and Comtesse 2004; Warren 1995, 2001). Information from these reports is factual and descriptive. However, there is little contextualisation of this rock art body, or contemplation of the information inherent within its nature and extent, within that of the larger Pilbara Region.

MARAPIKURRINYA ENVIRONMENTAL CONTEXT

Marapikurrinya is located on the northwest coast of Australia, within the Pilbara bioregion of Western Australia (Figure 1.1). The bioregion, climate, geology, history of sea level change, vegetation and fauna for the study area are presented here. Some of this information relates to
contemporary systems or to the recent past, and caution must be used, given the paucity of paleoclimatic data, in extrapolating these factors in understanding the production of these rock art sites. Where information can be linked to specific temporal periods, this information is explicitly provided. Of particular interest are changes in sea-level, with Marapikurrinya’s transition from a riverine system on a coastal plain, to a coastal estuary, and the impact this would have had on people and how it may be reflected within the rock art repertoire here.

Figure 1.1 Aerial map of Marapikurrinya harbour, Pilbara coast, and Western Australia (Clockwise from top; NearMap)
**BIOREGION AND CLIMATE**

The Pilbara is today classified semi-arid (Beard 1975), with three distinct landscape formations:

- A tropical arid coastal plain;
- Inland ranges; and
- Arid desert zone.

Marapikurrinya is on the tropical arid coastal-strip, noted by Semeniuk (1996) as the most arid coastal strip in Australia. This is connected to a low relief riverine hinterland, and these two landforms comprise the Abydos Plain.

Marapikurrinya borders the Australian arid zone with a climate which has been described as arid tropical (Brown 1987; Gentilli 1972) or semi-desert tropical with summer rain (Beard 1975). The region is characterised by hot summers and cool winters: average temperatures for Marapikurrinya range from 36.6°C in December to 27.5°C in June. Rainfall can be irregular, with 300mm the annual average precipitation, which is mainly attributable to cyclones that cross the Pilbara coastline from December to April (Beard 1975, Mabbutt 1971). Because of this, there is a seasonally active river network. Evaporation rates are approximately 2,480mm per annum and the average relative humidity is 55% (Bureau of Meteorology 2016). Throughout the Holocene this pattern has changed, with variable aridity, and changing sea-levels. These patterns are explored further below, and in relation to the movement of people in Chapter 4.

**GEOLOGY**

The geology of this section of the Pilbara coastline has been characterised by broad bands of tidal flats and sandy calcarenite elongate island chains, which Eliot and Bird (2010:1285) state are remnants of a large ‘zeta-form’ Pleistocene embayment. These calcarenites are Pleistocene-aged, and underlie Holocene units, and in some of the older ridges, overlie older red Pleistocene sediments. Younger ridge sections overlie younger red Pleistocene sediments (Figure 1.2).
The calcarenite is cemented by sparry calcite, or white and red calcretes, with red mud and sand infiltrating the matrices through solution pipes and cavities (Semeniuk 1996:53). These solution pipes form distinctive holes or vughs within the rock surface that create a unique surface on which animals and humans live, and they store water following rainfall, creating a fresh water resource. Additionally, these vughs were sometimes incorporated by artists in the creation of rock art (Figure 1.3).

A sample of the Two Mile ridge was collected by Clarke (1978:62), who identified the geology as an oolitic calcarenite. Weathering rates of this kind of rock are affected by pH of rainfall, internal structure of that section of the ridge, temperature, and immersion time in liquids. In comparison with other rock types of the Pilbara where engravings are located, the weathering rates here are considered much higher. This is particularly so in contrast with the Dampier Archipelago where ‘natural’ weathering rates have been calculated at rates as low as 0.15mm per 1000 years, amongst the lowest in the world as measured by cosmogenic nuclides (Pillans and Fifield 2013).

The slightly elevated calcarenite ridges of Marapikurrinya have been shown to be foci for people in the landscape, marked archaeologically by multiple signatures, including rock art (e.g. Figure 1.3), shell middens, grinding, and other artefactual remains (e.g. McCarthy 1962).
Figure 1.3 Examples of solution hole or vugh in calcarenite, with engraving incorporating it (Site South West Creek 3)

Sea Level Change

The current Marapikurrinya coastline is a Holocene-aged formation, with remnant Pleistocene markers including Pleistocene-aged red sediments (see Figure 1.2). The current Marapikurrinya harbour is argued to be the remnants of an old Pleistocene aged river delta (Eureka et al. 2007; Semeniuk 1993, 1996).

Sea level height has undergone drastic changes throughout human occupation of this region (see Figure 1.4). Coastal modelling has shown that at the height of the Last Glacial Maximum, when sea levels were ~130 metres lower, the shore line was approximately 120 kilometres north of its present position and the Marapikurrinya region was part of an extensive coastal plain (Kendrick et al. 1991; Ward et al. 2013). Additionally, as the shelf was submerged with transgression after the LGM, at depths of between 13.5 and 12.5 metres, past shorelines were preserved as bathymetric features (Ward et al. 2013), reinforcing current models of sea level change and subsequent shoreline creation and submersion.

The sea level reached its present level in the northwest around 6800 cal. BP (See Figure 1.4, Lewis et al. 2013). Estuarine sediments underlying most of the current sand features in the study areas accumulated, probably at a time of slightly higher sea level. These sediments contained estuarine shells (collected for radiocarbon dating by Sullivan et al. 2011). Little or no
Anadara granosa shell was found in these sediments – an intriguing pattern given the dominance of this species in the overlying deposits. This suggests uniform and shared environmental changes occurred both in this area as in other parts of the coastal Pilbara, as indicated by the presence of mangrove gastropods and the absence of Anadara in older shell deposits, and its overwhelming dominance in younger deposits. The transition from mangrove (e.g. Terebralia sp.) to intertidal r-selected species such as Anadara granosa forms a distinctive and repeated pattern along the Pilbara coast (Bowdler 1990; Clune and Harrison 2009; Kendrick and Morse 1982; Semeniuk 1996; Veitch 1999; Veth et al. 2014), and this will be explored in detail in Chapter 4.

![Figure 1.4 Changing sea levels along the Pilbara Coastline (Source: Adapted from Berry)](image)

Two recent high sea stands have occurred in this region, dated to around 6000 BP, where the ocean was 1.9-2.2 metres above current sea level, and around 1500 BP, where the ocean was 0.5 metres above the current sea level (Baker et al. 2001). Evidence for these high stands includes high tidal crusts present below excavated midden material (Eureka et al. 2007:12). It has been proposed (Eureka et al. 2007) that these hard, indurated surfaces may have been attractive living and camping surfaces flanking the retreating seas, as they were located above the...
mudflats: and that the midden sites formed as people used these platforms to process and consume shellfish above the mangroves and tidal creeks. Further, they propose that the red pindan dunes (Semeniuk 1996) have formed over the top through alluvial and Aeolian deposition in the last 4-5 thousand years.

Given the Abydos Plain is an expansive low gradient coastline, relatively minor Holocene oscillations in sea level would have significant and complex spatial and sedimentary consequences on intertidal and supra-tidal landforms, and on the ecology of such tidal zones (see Beaton 1985). Recent tidal modelling by Ward et al. (2015) for the Northwest shelf predicts that sea level changes before and after the LGM would not have necessarily created a depauperate coastline (Beaton 1985). Instead macro-tidal regimes may have ensured that this procumbent shelf was relatively productive for marine hunter-gatherers over the preceding 40,000 years; a pattern now finding confirmation from ongoing work on Pleistocene-aged middens from Barrow Island (Veth et al. 2014, 2017). In short, coastal foragers are likely to have been tethered to a comparatively productive maritime zone since the terminal Pleistocene and certainly throughout the Holocene.

Within this dynamic coastal environmental context, people would have had to find ways to manage their territory and social connections between hinterland, coastal and adjacent seascapes. Loss of land through inundation, as well as changes in the faunal and marine assemblages should be seen in cultural responses, such as changing group affiliations, inter-group connections, diet, and material culture choices. And it is predicted that within this context rock art would have played a key role in how people managed these environmental and attendant social changes.

**CURRENT CLIMATE, VEGETATION AND FAUNA**

Although the environmental context in and around Marapikurrinya has changed significantly from the Pleistocene into the Holocene, it is argued that Holocene variation – the period focussed on in this thesis – is less variable. Consequently, current climate, vegetation and fauna are presented to provide a context for the recent archaeological patterns described here.

The Marapikurrinya region is within the Fortescue Botanical District, which forms part of the Eremaean Botanical Province (Beard 1975). The vegetation of this district is characterised by *Eucalyptus sp.* tree and *Acacia sp.* shrub steppe communities, and *Triodia pungens* and *Triodia wiseana* spinifex species. *Ficus platypodia* are also found along the coastline, commonly in association with the limestone/calcarenite ridges (Mattiske 1994). Additional plant communities include:
• Hummock grassland: *Triodia secunda*, *Triodia pungens* and *Plectrachne schinzii*;
• Low shrub steppe: *Acacia translucens* over *Triodia pungens*, *Plectrachne schinzii* on red sands;
• Tree steppe: *Eucalyptus victrix*, *Acacia cowleana*, *Acacia tumida*, *Carissa lanceolate*, *Ehretia saligna*; over mixed grasses and *Plectrachne schinzii*. *Triodia pungens* on red loamy sands with clay;
• Shrub steppe: *Acacia cowleana*, *Acacia tumida*, *Eucalyptus aspera*, *Eucalyptus terminalis*, *Dolichandrone heterphylla*, *Grevillea pyramidialis* and occasional *Owenia reticulata* over grasses and spinifex on red loamy soils;
• Halophytic complex of Chenopods and grasses on sand over clay;
• Mangroves of *Avicennia marina* and *Rhizophora stylosa*;
• Coastal complex of *Spinifex longifolius* and mixed shrubs on sand;
• Coastal complex of *Acacia bivenosa*, *Ficus platypoda*, over *Triodia pungens* and grasses on limestone; and
• Tree steppe of *Eucalyptus victrix*, *Acacia cowleana*, *Acacia tumida*, *Acacia trachycarpa* and *Melaleuca argentea* ssp. *argentea* in red loamy sands on creekline.

Mattiske (1994) identified the coastal limestone habitat, with *Ficus platypoda* on the Marapikurrinya coast, as particularly significant to fauna. Alongside mangrove and mudflat communities and isolated patches of woodland, these habitats can support a range of specialised fauna beyond the more homogeneous country around these habitats (1994:22), including protected migratory bird species and the gecko *Gehyra nana*.

The extensive mangrove flats have been undermined by land reclamation in the 1960s which altered the flow of tidal creeks which originally fed the mangroves (Mattiske 1994). Mangrove vegetation remaining includes *Avicennia marina* and *Rhizophora stylosa*, with saltbush and assorted grasses found close to the shore. Further inland the limestone ridges are dominated by spinifex (*Triodia pungens*), introduced Buffel grass and a few *Ficus platypoda* trees.

The Marapikurrinya coast is particularly rich in bird species. A 1994 survey recorded 69 bird species from an area around Boodarie (close to this research’s study area), and identified an additional 69 probable species that are seasonal or occasional visitors (Mattiske 1994). Six native mammal species were also recorded in this study, and 14 probable species known from the region; 26 reptile species including the *Gehyra nana* gecko, previously only known from the Kimberley region of Western Australia (‘WA’), and now found on the calcarenite ridges fringing mangroves. This reptile list includes two species of endangered turtle: the Loggerhead and Leathery turtle (See Table 1.1).
<table>
<thead>
<tr>
<th>Fauna</th>
<th>Species</th>
</tr>
</thead>
</table>
| Terrestrial | Red Kangaroo  
|          | Common Wallaroo  
|          | Dunnart  
|          | Bat  
|          | Flying-fox  
|          | Legless lizard  
|          | Dragon lizard  
|          | Skink  
|          | Monitor  
|          | Pythons  
|          | Water snakes  
|          | Elapid snakes  |
| Avian | Emu  
|       | Heron  
|       | Osprey  
|       | Kite  
|       | Sea Eagle  
|       | Falcon  
|       | Kestrel  
|       | Quail  
|       | Bustard  
|       | Plover  
|       | Curlew  
|       | Sandpiper  
|       | Gull  
|       | Tern  
|       | Pigeon  
|       | Galah  
|       | Cockatiel  
|       | Nightjar  |
| Marine | Ground and Tree Frog  
|        | Loggerhead Turtle  
|        | Leatherhead Turtle  |

**Table 1.1** Common Terrestrial, Avian and Marine Fauna (see Mattiske 1994)

This combination of terrestrial, avian and marine fauna presents a rich and diverse habitat structure, focussed along this narrow coastal strip.
Marapikurrinya Land Use and Site Impacts

Marapikurrinya today is a major shipping port, having been established as a township in 1896 (McCarthy 1962). Early European settlement came in the form of ephemeral pearling camps, with the harbour first named Mangrove Harbour in 1863 by the pearling Captain of the ship the Mystery – Peter Hedland. The township was named Port Hedland by the Surveyor General Hunt at the same time (The Inquirer 4 November 1863:3). The discovery of gold at Marble Bar resulted in an increased population in the region. Sheep stations were established across the northwest from 1864 (Paterson 2006). These pastoral stations were likely nodes for cross-cultural interaction between pastoralists and various language groups including the Kariyarra (Paterson 2006).

When McCarthy undertook his fieldwork in Marapikurrinya in 1958, a manganese cracking plant, the main highway and several quarries were already impacting on the rock art sites along the limestone ridges around the township (McCarthy 1962). The port experienced a dramatic increase in traffic from 1965 with the shipping of iron ore and expansion of the rail lines servicing the port. The township has grown substantially in size as has the associated infrastructure. The harbour has been repeatedly dredged to allow for larger vessels. Several rock art sites have been impacted. The once extensive Two Mile Ridge site complex (see Chapter 4), has experienced major disturbance including:

- Wilson Road works constructed in the 1890s;
- Construction of an overland telegraph line in 1909;
- The Marapikurrinya to Marble Bar Railway line and causeway in 1909;
- Construction of an overhead power transmission line in 1950;
- The development of Manganese stockpiles, handling and loading areas from 1960 to 1965;
- Construction of the Mt Newman [now BHPBIO] railway line and associated infrastructure in 1966 – present; and
- Erection of a dual 66KV overhead power transmission line in 1980 to the present.

Two Mile Ridge is one of the larger sites in Marapikurrinya, and was formally declared a reserve in 1935 (Atkins 1990). This was also the largest semi-permanent Aboriginal camp located close to the Port Hedland township during the contact period – and in particular during the Pilbara Strike. By the 1960s, increased housing developments in town and impacts from other developments at Two Mile led to abandonment of this fringe camp.
Severe impacts to major sites located within the central Marapikurrinya township followed its establishment, and subsequent impacts following growth of iron ore mining in the Pilbara from the 1960s onwards. These impacts and loss of cultural sites located close to the township are viewed against potential future impacts at other sites around the Marapikurrinya harbour. These impacts are predicted to be both natural (e.g. erosion from wind, water and sedimentation, plant growth and cyclone activity), and human (e.g. development, camping, crabbing).

South West Creek 4 and Mourambine Kariyarra 3, the two tidal islands selected for this research, have been selected because they have had relatively little impact. The theoretical approach deployed in this study will be presented in Chapter 2. By using these two high-integrity, representative and surviving samples of rock art, I am able to compare them to known information from recordings undertaken closer to the Marapikurrinya township.

The importance of these two tidal islands for this research is centres around their Holocene coastal contexts, providing abundant and immediate resources, whilst being bordered by an arid hinterland. This productive ‘maritime desert’ (Veth et al. 2014) provides a prime research area to explore questions of Holocene rock art marking and is a vehicle for presenting and negotiating identity, in the context of a dynamic environmental setting.
CHAPTER 2: THEORY – STYLE, AGENCY AND ETHNOGRAPHY

THEORY

Rock art can be studied archaeologically in the same way as any other material culture: by exploring patterns within motifs, such as location, form, technique and style. Rock art also has the benefits of being durable, is fixed in the landscape, and the result of deliberate action which creates markings and images, the remains of which we see today, and can attempt to decipher in something approaching an emic understanding. Each of these factors - location, form, technique and style - will be explored within a style and agency-based theoretical framework. These formal methods are contextualised with ethnographic sources. This chapter discusses the theoretical approach used for this research, and then provides the methodology employed within this framework to meet the stated research goals.

‘Rock Art’

Rock art is here defined here as intentional human-made marks on rock surfaces (Sackett 1990). These marks may be additive ('paintings' or 'pictographs'), made with pigment that has been painted, drawn or sprayed on, or using mediums such as beeswax pellets; or subtractive ('engravings' or 'petroglyphs'), made by actions such as engraving, incising or rubbing (Rosenfeld 1991). These actions may create a recognisable image that resembles something in the physical world. Alternately, the marks may be more esoteric, such as gestural marks, or geometric shapes and symbols. The interpretation of these marks and how we understand them archaeologically is discussed in more detail below. The rock art of the Marapikurrinya region is all engraved using a variety of different (subtractive) techniques.

The terms used when analysing rock art are fraught with danger, including 'art' itself, alongside terms used to classify and interpret rock art like 'motif', 'style' and 'agency'.

Use of the term 'art' can create Western-centric theoretical assumptions about the function or medium of rock art broadly, and the Marapikurrinya engravings specifically. In defining what art is within an Aboriginal context, it has been proposed that "most indigenous [sic] art is only 'art'...because we think it is, not because the people who made it think so" (Gell 1998:5). Gell is referencing not rock art, but modern Aboriginal artwork, but I would argue that his suggestion is equally applicable for rock art as well - the labelling engravings as 'art' may say more about how we are choosing to understand these things, and how we can fit them within our own cultural context than what they mean in an emic sense.
Alternately, Morphy (1994) has argued for a dualistic approach when understanding rock art, where both aesthetics and representational purposes may both be functional and of importance. This means that the way the thing looks is important itself, aesthetically, as well as any other encoded information that may be preserved within it, using style as a vehicle (Wobst 1977). Both the aesthetic qualities of rock art, and development of styles, will be argued in this thesis to have importance, not only to outside (etic) researchers, but to those people who created them.

The term ‘rock art’ will be used in this thesis, as defined above and considering these philosophical underpinnings.

**Durable and Fixed**

Rock art is both durable and fixed in the landscape, and these inherent factors present a unique medium to understand human symbolic behaviour through time and space (McDonald 2017). Rock art presents one component of past systems of expressive behaviour (Rosenfeld 1981), and its durability makes it the lasting part of a broader suite of symbolic behaviour such as can be seen in sand and bark drawings, body painting, personal adornment and decoration of wooden objects such as shields, boomerangs and spearthrowers. The durable nature of rock art needs to be understood within this broader system of shared symbols and imagery that themselves can pass between media. The movement of imagery between media raises questions about the importance of the imagery or the medium, and the relationship between the two. Whilst the main focus of this research is on the engraved rock art of Marapikurrinya, the presence of material culture objects (shields, spearthrowers, boomerangs and axes; some marked with designs) depicted within that engraved repertoire, which are marked with designs, highlights the importance of interrogating these images between mediums.

These inherent qualities – durability and being fixed in space – also bring difficulties, particularly temporal control. Scientific dating of rock art is notoriously difficult, particularly for engraved images (e.g. Dorn 1994, 2001; Watchman 1996; Zilhão 1995). Additionally, it is incredibly hard to temporally fix images and symbols, for example concentric circles, which can move through time and space, and have the potential to be appropriated or reactivated by different groups.

Without temporal certainty, it may be impossible to accurately determine whether these media are in use at the same time, however, ‘shared’ imagery does create a connection that can be followed through space.

Being fixed, rock art retains its physical connection to a place – which contrasts with other categories of symbolic repertoire (body art, portable art, patterned material culture) that have
mobility and consequently changeable connections to place. While the rock art itself is fixed, people can move through landscapes, and with time, different people can experience the same place and the permanent things within those spaces. This conundrum has been summarised by Rosenfeld, who argues that when looking at the rock art associated with a group, “much of it will outlive the period and cultural context of its production, leaving marked places in the land that pertained to earlier social geography” (2002:62).

Being durable and being fixed in place, different individuals and potentially different groups through time may experience and engage differently with the same rock art and its imagery, which holds great potential for recursiveness (Morphy 2012; McDonald and Veth 2013b). By being fixed in place rock art can become imbued with cultural meaning, or meanings, through time. Rock art can provide a lasting link or record of ancestral activities, be identifiable in mythological narratives, and can be used as mnemonic devices for stories, and identifying places in the landscape (McDonald and Veth 2013a, 2013b; Rowlands 1993; Schaafsma 1985). Consequently, these links and associations can be reactivated differently by successive generations.

‘FIGURATIVE’, ‘NON-FIGURATIVE’ ART AND THE ‘MOTIF’

The analysis of rock art by archaeologists and rock art specialists has traditionally focussed on identifying things (Clegg 2002). In this fashion, hierarchical categorical frameworks are commonly developed to classify and order rock art assemblages into groups taxonomically. This often distinguishes ‘figurative’ from ‘non-figurative’ art. This archaeological approach of overlaying a typology onto a rock art assemblage, to allow for classification and comparison with other rock art assemblages and to make analysis systematic, comes with advantages and disadvantages. Advantages include the ability of researchers etically to label images according to what they see in nature, while recognising that these are classificatory tools and not a master key for interpretation (McDonald 1994; Officer 1992). Disadvantages include creating meaning that may have no relevance to the images themselves, and instead providing meaning relevant only to the archaeologist. The purpose of classification systems is to enable archaeological analysis through pattern recognition: it acknowledges that rock art had meaning to the people that created it and it allows archaeologists to discern patterning in this creation (Rosenfeld 1991; McDonald 2008).

To understand how archaeologists apply labels to figurative images, Clegg (2002) explored bias in human perceptual systems towards the recognition of things. He argued this was coupled with an innate human expectation that rock art is ‘pictures of things’. Officer (1984) argued that the archaeologist can rely on universality in human processes of perception and representation
to apply labels to things that look like things in the natural world, to avoid "paralysis induced by uncertainty" (Spaulding 1953:1). Figurative art comprises recognisable forms to crystallise concepts: essentially reducing some of the potential meanings that each form can give. For example, a kangaroo may represent the animal, a totem, a story, or a place, but the kangaroo motif provides a tenable link or connection to the form, even though this meaning is neither fixed nor permanent. In contrast, geometric motifs have greater potential to contain layers of meaning, without being fettered by direct visual associations (Munn 1973). In this sense, non-figurative motifs have greater emic flexibility. Consequently, figurative rock art can allow etic researchers greater confidence in interpreting stylistic patterns, coupled with inferred encoded group identity information.

To interpret repeated patterns seen in rock art and to attempt to access meaning or narrative, the term 'motif' is used. This word provides a label for recurring forms within an allowable range of variation and composition by a finite set of attributes allowing them to be grouped and considered as a group. A motif can also transfer styles or ways of doing, which will be discussed below.

Through classification archaeologists use a traditional toolkit of exploring variation to garner meaning. While the original intention or purpose behind individual images may never be known, we have the ability to construct a narrative based on analytical techniques informed by a consistently applied theoretical framework. In situations where ethnography is available, additional meanings may be attributed to an image, although the traps of ethnographic analogy (Lewis-Williams 1991; Wylie 1985) mean that these meanings may only reflect the recent past and/or the perceptions of the archaeologist as interlocutor.

**THEORIES OF STYLE**

As the language and tool chest with which we materially interfere with each other, style is that part of our artefactual repertoire that makes us human.

(Wobst 1999:120)

Forge’s definition of style is used here, this being “a consistent set of preferences for certain forms and modes with a range of permissible variation” (Forge 1977:30). Style then, represents what Rosenfeld labelled “encultured convention”, as it conveys meaning that is created in that way by an enculturated person, and can be understood by someone of that culture (Rosenfeld 2000:56).

It is assumed that Forge’s ‘permissible range of variation’ is determined by the social group, and enacted by individuals within that society who are operating within those limits. Using style within similar parameters, Conkey (1990) has proposed that style is readable on the following assumptions:

1. Variation in artefacts, including stylistic variation, can be considered as if it were a language (see Pitt-Rivers 1874; Tilley 2015) – it can be patterned and decoded;
2. Material culture variations are products of specific, potentially identifiable cultural; subsystems, where artefacts are material correlates of that culture; and
3. The patterns then can be said to reflect sociocultural phenomena (Conkey 1990:10-11).

These three assumptions allow for style within rock art assemblages to be analysed as embodying culture, with a few qualifications. The connection Conkey makes between language and style provides a strong analogy to explore the repeated patterns found within stylistic systems, but may force too rigid a structure onto the use of style that individual and group agency will effect (Bourdieu 1977; Giddens 1979). Gell argues that the visual is not structured in the same hierarchical fashion as language. Where language has a hierarchical syntactic structure from phonemes to morphemes to syntactic structure, and in comparison, Gell proposes that a dot or zigzag, cannot be broken down into its constituent parts, where a dot equated to a phoneme or necessary building block in communication (1998: 164).

Alternately, researchers like Tilley (1991, 2015), Hodder (1989) and Ricouer (1977) have looked at style in material culture as a text, rather than language itself. This allows material culture to be read in new contexts, and allows for reinterpretation, rather than static meaning (Hodder 1989). A ‘text’ also allows for the reader and viewer to be introduced, and to bring their own interpretation to creation of meaning. An Australian example in support of text could be made for geometric art styles where symbols have known meanings, such as in body paintings used by the Yolngu in northern Australia for the transmission of religious knowledge, and who themselves refer to these paintings as text (Morphy 2009:16).
Classifying style as analogous to either language or texts however does not affect the ability to use style to discuss group identity. Following Conkey’s argument, style should be linkable to particular social groups, as also argued by Wobst (1977), Plog (1980) and Wiessner (1983). Wiessner (1983) argues it is style that brings the social group into existence archaeologically, allowing the archaeologist to examine the kind, frequency and direction of interactions between social groups. At the same time, Plog (1983) developed the interaction theory of style, which proposed that the higher the stylistic similarity between sites, and the lower the degree of stylistic homogeneity within sites, the greater will be the interaction between social groups.

Plog’s work builds on the work of Hodder (1978), Wiessner (1983) and ceramicists exploring style as a means of understanding cultural identity, stating that the causes of stylistic variation are complex and need to be properly assessed (1983:126). He provides cautions against early simplistic interpretations that came out of ceramic analyses which suggested that “the degree of stylistic similarity between individuals, residence groups, or villages is directly related to the amount of social interaction between those individuals, groups, or villages,” as this model assumes discrete social groups with large spatial isolation from the next group. In the Australian context, this ‘social isolation’ is not valid, and instead complex social networks and chains of connection from colonisation onwards have been argued to be the norm (Akerman and Stanton 1994), also noting that Plog’s example utilises agricultural as opposed to hunter-gatherer populations. Additionally, Plog cautions against the isolation of stylistic studies in looking stylistic diversity amongst pots in isolation for example, instead recommending we look at style across material types to allow for a more accurate understanding of group identity (1983).

From the basic tenet of style as a vehicle for social identity, Wobst (1977) proposed that style is also a vehicle for information exchange (Information Exchange Theory, ‘IET’). He argued that the more visible an artefact, the more likely style would be used to convey information about social group affiliation. Using an ethnographic example from north Cameroon, Sterner (1989) found that the least visible pots were the most elaborately detailed and would need to be seen up close to portray information. She concluded these did not fit Wobst’s model as they were interpretable to ‘insiders’ only. Franklin has interpreted Wobst’s model in terms of stylistic complexity, without specifically addressing the ideas of inside and outside stylistic use, within and between social groups. However, what becomes clear is that Wobst’s original theorem needs to be applied with an understanding of the social context of production of the artefact.

Wobst’s revision (1999) of his 1977 proposal, which he labelled ‘mellowed functionalism’ (in Conkey 2006: 36), proposes that style ‘is that aspect of our material world that talks and interferes in the social field’ (1999:119), in line with Giddens (1979) notion of ‘enstructuration’.
Enstructuration allows for multiple social actors within the same cultural system to arrive at different optimal solutions, that is different visual outputs. This reworking allows for some variation within a given social group, and provides for an element of individual agency within a group. Wobst’s more recent iteration recognises that for the same message to be retold and to still be given attention, changing form or style may be needed.

Where it can be shown that a social group is actively using style to convey information, questions around the function of the art can be explored. Wiessner’s analysis of style (1990) questioned how to assess whether style was being used actively or passively, and in what contexts you would expect this kind of functionality. For example, she proposed that if the function of style is for boundary maintenance, active iconological style should be visible in material culture. Further, where isochostric style is present, i.e. the result of an individual’s unconsciously encultured knowledge (Sackett 1990), the style will not function to reflect social boundaries. To understand functional uses of style, particularly through information exchange, exploring variability amongst rock art repertoires can provides a rich avenue of inquiry. Over the last decade, with a few exceptions (e.g. Domingo-Sanz 2012) there has been very little research looking at style and rock art. This research then revisits a productive research field that has fallen into relative inactivity.

**Stylistic Heterogeneity and Homogeneity**

The relative stylistic homogeneity and heterogeneity of a rock art assemblage has been used to define functional questions within a stylistic framework: such as the impacts of territoriality and boundedness, exploring exchange, social interaction and aggregation, and concomitant open and closed social networks. Heterogeneity and homogeneity must be measured against each other, i.e. it is relative. There are clear pitfalls that will be addressed here, such as the role that the researchers’ classification may play affecting relative variability (McDonald and Veth 2006; Gamble 1982; Soffer 1987 and Smith 1989).

Traditionally, stylistic homogeneity has been linked with open and extended social networks, such as seen in arid zones of Australia in recent times (Frederick 2000), while stylistic heterogeneity has been linked to fertile environments where highly territorial groups are identifiable by bounded networks (Conkey 1978, 1980; Gamble 1982; Smith 1991, 1994; McDonald 1994, 2008; Rosenfeld 1997; McDonald and Veth 2006). Whilst this is a general hypothesis, it is presented here recognising the importance of properly contextualising a rock art corpus, prior to further analysis.
Conkey (1978) argued that the development of style within European Palaeolithic art was for the purposes of boundary maintenance. In this way, stylistic heterogeneity should be observable inter-group, and differences should be most visible at the boundaries of the groups as a signalling of their difference.

Conversely, Gamble (1980, 1982 and 1991) developed theories of open exchange across vast areas arguing there were no boundaries, where this information exchange was seen as encoding widespread information. Gamble’s use of ‘Information Exchange’ refers to style in material culture, arguing groups of people had widespread alliance networks across Palaeolithic Europe because of the distribution of stylistically similar ‘Venus’ figurines. Gamble argued that “open social networks have probably always been a feature of poor environments”, resulting in homogeneous styles being used across broad regions (1982:101).

In the Australian context, the settlement of the continent was initially by small groups of people who would not have been in constant verbal contact with each other to communicate (Balme et al. 2009; Smith 1992). Rock art provided a visual communication system, through encoded stylistic information, which enables the movement of people through new landscapes, and for the sharing of information about those landscapes.

It is generally accepted that there is an early Australian homogeneous arid-zone engraved style (e.g. Franklin 2004; Maynard 1979; McDonald and Veth 2010, 2013), which would have facilitated continental settlement (Balme et al. 2009), and the movement of early groups across the greater Australian landmass, being a durable, fixed source of local information. This was then superseded by the development of regionally variable styles (Basedow 1918; Edwards 1979; Maynard 1979; Mountford 1959, 1960), as people accumulated knowledge and constructed distinct social identities. This process is identifiable as distinct social regions in the Pleistocene (Veth et al. 2011).

McDonald and Veth (2006) have looked at stylistic heterogeneity within Western Desert rock art to explore social networks. They propose that within the Australian arid zone open social networks were in operation and that homogeneous art systems operated to provide social cohesion over large distances and through time. Heterogeneous rock art styles can also be observed and are explained both as evidence for different groups of people aggregating to maintain social cohesion, as well as indications of when less arid phases were in operation, desert peoples became more bounded in their distribution (McDonald 2016; McDonald and Veth 2006, 2013a). McDonald and Veth have argued that this pattern confirms the essential nature of social networks in the arid zone. The environment requires people to exercise high levels of mobility and separation between groups for much of the time – but that aggregation
behaviour is essential, and the effect of this 'dual signalling' behaviour is visible within the variability demonstrated by rock art assemblages (McDonald and Veth 2006:98).

Stylistic variability, in particular rock art corpuses, has also been interpreted as indicating functional difference (Galt-Smith 1997; McDonald 1994; McDonald and Veth 2006). In the fertile Sydney Basin region McDonald (2008) demonstrated that larger-scale group cohesion was evidenced in the engraved rock art, in contrast with small-scale localised group identifying behaviour in the pigment rock art. This correlated with site access, audience and inferred function (i.e. Wobst 1977) in which openly accessible art would be viewed by many and would have broad scale messaging: art produced in a domestic context, and seen by only local groups, would demonstrate local group identifying behaviour. Similarly, Galt-Smith's (1997) Central Desert research found localised signalling in pigment art, and homogeneous patterns in the engraved art.

Therefore, to understand the relative stylistic heterogeneity or homogeneity of an art body and to understand what that might mean, temporal control, the social context of production and detailed analysis within and between rock art assemblages is required. Any one rock art assemblage may contain both homogeneous and heterogeneous elements, indicating that the art has been used for different purposes. These kinds of analyses will provide a more nuanced understanding for particular social groups.

Understanding the heterogeneity or homogeneity of a given art repertoire is integral when applying a stylistic framework to rock art, as an archaeological proxy for internal and inter-group social behaviour. The next question must be that once this variability is identified and understood, what are the interpretive frameworks that can be used to determine whether rock art motifs are consistent or not?

**Style and Agency, and Relevance to Perception**

Understanding human agency is fundamental to analysing variation in rock art style, with different implications at the group and individual level. Agency will affect variation within a style, and needs to be identified to separate out allowable variation within, for example, a motif that remains classifiable within a certain style (Munn 1973). Through space and time motifs may change – perhaps as they are copied imperfectly or selectively – but remain within the same style (Clegg 1987; Franklin 1989). The critical step here is to define what is causing the divergence, is it allowable ‘noise’ (Barton et al. 1994: 188) or intentional divergence from a common antecedent form? In determining the probable cause, a clearer understanding of the function of style in rock art can be addressed: is style reflecting social processes, as argued by
Barton et al. (1994), is it creating them, or is there a third possibility that style within rock art assemblages is both reflecting and creating social process?

The consciousness or unconsciousness of stylistic signalling also needs to be addressed. Style can be either active or passive (Wiessner 1990), and this is connected to function. For example, if the function of style is boundary maintenance, active ‘iconological’ style should reflect a delineated territorial boundary, where passive style, such as Sackett’s ‘isochrestic’ style, would not reflect those social boundaries as clearly. Isochrestism was introduced by Sackett (1990) to explain passive style, where group identity is seen in style, being a ‘latent quality that potentially resides in all formal variation in material culture, including variation regarded as purely functional in the utilitarian sense (1986:266). Sackett’s ‘isochrestic’ style assumes that much of an individual’s cultural knowledge will be unconsciously stored, and that in the creation of rock art, or other material culture, the individual makes unconscious decisions from a variety of learnt enculturated alternatives (see also McDonald 1999). This passive expression of style then is distinct from agency, which involves active, iconological style choices.

The role of agency in rock art can be explained as follows:

A tree can be drawn, for instance, with the branches extending upward rather than down, or with curved branches rather than straight ones. The problem is whether these and other variations in form are simply free variants – either standardised alternatives or idiosyncratic variations subject to the invention and whim of the painter – or rather indicators of some regular change in the meaning of the element. (Munn 1973:937)

We need to find a method for understanding the patterning of the tree’s limbs, and this patterning is important. One method would be the use of a hierarchical classification system, which groups ‘like- things’ together. A rock art typology has types which have some meaning, as well as groups that relate ‘like’ things.

Gell’s (1998) research attempted to provide an anthropology of art, and when discussing the agency of art, he returns to the discussion of how art itself can be classified, in relation to language. He proposed that art objects could be icons or indexes, but never symbols. This review has met with various criticisms because rock art is not ‘art’ (Conkey 2006; Layton 2003; Morphy 2009), with Layton providing a re-writing of Gell’s analysis about index, icon, sign and symbol. This critique aligns with Gell’s rejection of visual communication as language, and develops the argument for agency of individuals to shape the reading of art using cultural conventions. Agency, he argues, comes into being through material culture, however where the initiator and receiver do not meet. Layton’s position, as a semiotician, is that art is a culturally
constructed medium of visual expression, and linguistic analogies have limited value in understanding how the art object is extending its users agency (2003:460). Morphy (2009) has joined Layton, pointing to Gell’s attribution of agency to the object itself, away from the maker or individual. Morphy argues for art as a mode of action, and human agency in its creation as a means of intervening in the world, and this understanding of agency fits better with rock art research.

In assessing style in the engraved art of Marapikurrinya, the repertoire is broken down using a typology that is compatible with previous research undertaken there (e.g. McCarthy 1962) and elsewhere in the Pilbara (See Chapter 4). Variability is explored through identification of styles within this typological approach – grouping motif types by common form, technique and size – and looking within these groups at homogeneity and heterogeneity, for example how consistently are outline turtles being presented? Noted diversity can then be assessed within an agentive framework, that is, how much freedom there is within these motif types, and what this tells us about how people are communicating through this medium.

**USE OF ETHNOGRAPHY**

This thesis uses formal archaeological methods of pattern recognition, and interprets these using an explanatory framework which includes ethnographically-recorded information about the social and linguistic framework for the region. The research questions (outlined in the introduction), relate to the recorded ethnographic information and what kinds of meaning that these can add to the Marapikurrinya engravings. The data used in this analysis are limited to ethnographic information recorded between European contact in the 1890’s through to the 1960’s, utilising ethnographic sources that are in the public domain (e.g. McCarthy 1968; Palmer 1975, 1977; Petri & Schulz 1951; Radcliffe-Brown 1913; von Brandenstein 1970a, 1972). This limited ethnographic window of approximately 130 years is understood to be a temporally bound snapshot of Aboriginal culture in the northwest. This snapshot is assessed cautiously, recognising that ethnographies in general capture specific biased information that cannot be projected backwards into deep time (e.g. Wylie 1985). Nonetheless, the ethnography is a valuable heuristic tool for ideas that can be tested against the available archaeological record.

From these recorded sources, mythological narratives and references to rock art have been distinguished, to be compared with the engravings. The dangers associated with this approach include homogenisation of meanings through ethnographic analogy – based on the limited information recorded and potential time depth of the engravings – or bias – as a result of who provided and who recorded the information.
Lewis-William’s ‘Believing and Seeing’ (1977) and Vinnicombe’s ‘People of the Eland’ (1976) presented some of the earliest pieces of comprehensive research to link ethnography with rock art. Working in South Africa, Vinnicombe dealt with a similar situation to the Australian one, where the early ethnographic information is patchy, and dependent on a few individuals who were interested in recording particular things (Bleek and Lloyd 1911). However, she combined available ethnography with an archaeological approach to the types of motifs repeatedly seen in the rock art assemblages. She noted that the ‘Bushmen’ were not painting everything they saw, but were selecting important images and that the image itself was important, reflecting ideological structure, as opposed to a random assemblage of data. This lack of randomness in the art, and numerical dominance of specific motifs (i.e. eland) correlated neatly with ethnographic information around the importance of the eland to the Bushmen (1976:340). However, the neatness of the fit may still be a simplistic understanding of more nuanced information encoded within this art.

Ethnographic approaches to rock art are frequently criticised for use of ethnographic analogy and uniformitarianism (Blundell et al. 2010), transplanting known things into an unknown past. But in the application of archaeological narrative, Conkey has argued that ‘no formal methods could ever be taken up outside of some informing context, and anyone investigating imagery from an informing context approach must also use some methods or means to link the informing context to the images’ (2010:200). Additionally, research in Australia provides a growing body of analysis where careful ethnographic analogy has been successfully applied (e.g. Chaloupka 1993; David 2002; Frederick 2000; Galt-Smith 1997; Layton 1992; Taçon & Chippindale 1998). Elements to be aware of when assessing these resources include knowing who the individual was who provided the ethnographic information, as well as the recorder, in recognising potential bias within the recording. For example, a male recorder obtaining information from a male will most likely obtain ‘men’s’ information, to the exclusion of ‘women’s’ information. The context in which information is collected is essential in assessing potential bias and identifying where information collected may be gendered, topic specific, research led, regional as opposed to local, and so on.

The ethnographies used in this research are limited to published sources. Published ethnographic information from the Marapikurrinya region which discusses the engraved art tails off in the 1960s and 1970s with the work of researchers like McCarthy (1968) and Palmer (1975, 1977). This coincides with active research of Marapikurrinya rock art, with much subsequent work being desktop based (e.g. Franklin 2004).
While the current Aboriginal community maintains a connection to the rock art sites, they do not necessarily have first-hand experiences of the art being produced, or involvement of these engravings within their current cultural practices.

SUMMARY

The analytical approach outlined in this chapter argues that through the use of style theory, rock art can be analysed systematically like other archaeological material. A taxonomic approach is used (see Chapter 5), identifying motifs at class (e.g. Anthropomorph) and type (e.g. Minyiburu) level. This approach records attributes and variables to identify the style(s) evident in Marapikurrinya rock art. Style is seen as a vehicle for information exchange (Wobst 1977, 1999), and for this research key information within style includes group identity markers.

By classifying what constitutes the Marapikurrinya style, comparisons can then be made at a regional level, comparing Marapikurrinya with neighbouring Pilbara rock art repertoires, both along the coast and into the arid hinterland. It is recognised that there may be multiple styles within the Marapikurrinya repertoire, and that these may reflect temporal and other variations. It is this cultural context that I now explore in the next chapter.
I am convinced that these petroglyphs, associated with the numerous Aboriginal myths, legends and ceremonials, are part of a complex structure of religious and ritual manifestations that, in the re-enactment of the deeds of the Dreamtime, represents a combination of transmission of knowledge and information, combined with expression of ritual preoccupations, through the invocation of the spiritual and ancestral beings (Virili 1979:448).

This chapter explores the historical cultural context for the northwest, with detailed discussion and analysis of the Kariyarra cultural and linguistic bloc. Following Virili (1979) and his comments for the Burrup Peninsula (Murujuga area), it is argued that Marapikurrinya rock art formed part of a complex ritual structure. To understand how Kariyarra group identity is expressed through the engravings located in their culture area (Peterson 1976) the rock art is contextualised within this broader social milieu.

First, the Kariyarra language distribution within the Pilbara is explored, and the implications provided by linguistic family structures, and linguistic markers are discussed. Selected mythological narratives from Marapikurrinya (Port Hedland) are then discussed, identifying how mythologies might interact with language, the landscape and human modification of that space - such as through rock art. Second, local material culture (boomerangs, shields and spearthrowers) with distinct design patterns are analysed to explore their identity-negotiating capacity, and direct connection with Marapikurrinya engraved motifs. Developing these threads of evidence facilitates a complex and dynamic understanding of rock art within its cultural context will be provided.

This cultural context provides the social background for Chapter 5, which discusses the archaeology and rock art of Marapikurrinya and the northwest.

AUSTRALIAN LINGUISTICS AND IMPLICATIONS FOR ROCK ART

The linguistic structure of Aboriginal Australians has been described as globally unique. Languages within Australia have high neighbour intelligibility, but otherwise have low cognate density in comparison with the 'usual language families of the world' (O'Grady et al. 1996:24; Dixon 2001). It has also been said of Australian languages that the 'culture of multilingualism is so widespread...as to be virtually universal' (O'Grady et al. 1996:25). While this high degree of multilingualism in Australia provides for ease of language diffusion and divergence opportunities, Dench notes that a strong tradition of language integrity remains within
Australian languages: languages are connected to specific areas of land, and speakers of a language identify both with the country and the language itself (Dench 2001:109).

This connection between language and location is particularly pertinent to understanding styles used in Australian rock art. Previous researchers have argued that some Pilbara rock art styles may reflect modern cultural and linguistic boundaries, while others – potentially older styles – do not show the same distribution (McDonald and Veth 2006, 2013a; Wright 1968). Understanding the structure of, and changes in, linguistic groups across the Northwest allows for a discussion of potential chronological markers within languages – and their potential correlations to rock art style repertoires.

Harvey (2011) explored the flexibility of boundaries between language groups within Australia. He stated that when two adjacent sites have different linguistic affiliations, the nature of the zone of change in linguistic affiliation between the two sites varies considerably. In richly resourced areas there may be relatively clear boundaries, but otherwise specific boundaries are rare and the linguistic association of such intermediate areas is often to some degree indeterminate (Harvey 2011:356). In the Pilbara, this can potentially be seen in the rock art provinces along the coastline, which cover relatively small territories in a resource rich zone, with relatively distinct style boundaries. This is mirrored in the language group distributions (Figures 3.2 and 3.3 below) where Pilbara groups with coastal access are smaller, and more tightly packed, in contrast with the inland groups.

To understand the relevance of language groups across the Pilbara, and how Marapikurrinya inhabitants (Kariyarra speakers) fit within a complex network of languages, the Australian linguistic structure will be summarised within the Pama-Nyungan language bloc. Kariyarra is classified as a Pama-Nyungan language, and grouped with other Pilbara languages into the Ngayarda subgroup (Bowern and Atkinson 2012; Dench 1982, 1994; Oates 1975; O’Grady et al. 1966).

**The Pama-Nyungan Language Family**

Of the hundreds of language groups in Australia at European contact the clear majority are grouped as related and labelled the ‘Pama-Nyungan’ language family (see Figure 3.1). This language family covers most of the Australian landmass from the Cape York Peninsula to the south-west of Western Australia (McConvell 1996). Excluded from this language family are parts of northern Australia, around the Kimberley and Arnhem Land, and Tasmania. The distribution and spread of Pama-Nyungan languages across the continent provides an interesting linguistic conundrum, and the implications of this language family’s domination are explored here.
It has been argued by McConvell (1996), using comparative linguistics and ‘backtracking’ (known as ‘linguistic stratigraphy’ or ‘glotto-chronology’), that the expansion of Pama-Nyungan languages within Australia occurred over the last 6,000 years, with expansion into the west of Australia within the last 3,000 years. (O’Grady et al. 1966). This is supported by a phylogenetic approach used by Rose (2013), who adapted the rates of language change to Australia specific genetic and archaeological makers. He suggests that the major language groups were formed between 13-6000 years ago, and that contemporary languages were established within the last 3000 to 4000 years.

The expansion and rapid spread of Pama-Nyungan languages across the continent – and the exclusion of the territory covered by the non- Pama-Nyungan languages - is unique. Two key arguments used to explain this diffusion are culture contact and exchange (cultural diffusion),
and population movement (language expansion). McConvell (1996:128) defines cultural diffusion as the passing of an element of material culture between groups where there is contact between them, often with a lexical item or word exchanged with a cultural item: which is useful for looking at prior cultural contacts and directionality. In contrast, he defines language expansion as where one or more groups adopt the language of another group as their first language, creating language shift. During this process of language shift there is a period of bilingualism, and McConvell argues that this shift is almost always a result of migration where many settlers overwhelm a small minority local population. In the Australian context McConvell believes that the spread of Pama-Nyungan language speakers and consequently the language family was aided by movement into areas that were sparsely populated or unoccupied (1996:128). He links this movement to archaeological markers, such as the spread of the small tool tradition (and see Wurm 1972). This argument needs to be viewed in the context of the Pilbara between 6000 and 3000 years ago, which covers a period of increasing climatic instability in the Northwest (See Chapter 4, and see cautions about the timing of such industries: Hiscock 2011; Veth et al. 2011; White et al. 2011).

**Pilbara Languages and the Ngayarda Bloc**

Norman Tindale (1940, 1974) recorded at least 16 distinct languages across the Pilbara bioregion (see Figures 3.2 and 3.3). Eleven (Dench 1998) or twelve (O'Grady et al. 1966) of these, based on linguistic syntactic similarity, have been grouped as the Ngayarda sub-group: Martuthunira, Ngarluma-Kariyarra, Yindjibarndi-Kurrama, Panyjima, Jurruru, Nyamal, Yinhawangka, Ngarla, Nhuwala and Palyku (See Figure 3.1; Wangka Maya 2017); Dench (1998) excludes Palyku as a Wati subgroup language. Recent debate has questioned the validity of defining what a Ngayarda language is, and whether this sub-family classification is valid or possible (Dench 1998, 2001). However, Bowern and Atkinson’s (2012) Bayesian approach – which also used cognates – verified Ngayarda as a valid subgroup (contra Dench 2001), confirming that much of the Pilbara has some shared culture.

Historic recording of language group boundaries in the Pilbara are not rigid. Slight differences are notable between Tindale’s 1940 and 1976 maps (Figures 3.2 and 3.3). For example, the 1940 map shows the Kariyarra and their direct northern neighbour to be Ngarla, but by 1976 Tindale has revised this, due to a historic-period movement by Nyamal speakers to the coast, creating a separation between Kariyarra and Ngarla. This late intrusion is explained in terms of resource stress in the last century, and provides insights about the importance of coastal resources, and the presumed effect this has likely had on groups’ territoriality in the prehistoric past.
Figure 3.2 Extract from Tindale (1940) of Pilbara linguistic groups (Port Hedland indicated by arrow)

Figure 3.3 Extract from Tindale (1974) of Pilbara linguistic groups (Port Hedland indicated by arrow)
Tindale’s (1940, 1974: Figures 3.2 and 3.3) maps clearly identify that coastal groups tend to have smaller territories in comparison with inland groups, and that several coastal groups of the Pilbara also include tracts of hinterland clouding a genuine ‘coastal’ and ‘inland’ divide. Interestingly, large rivers do not act as territorial boundaries, but indeed flow through territories, and are shared by multiple groups. This watershed effect on culture blocs has been found elsewhere (McDonald 2008; Peterson 1976).

The importance of these river networks is central to a ten-nation ritual alliance as proposed by von Brandenstein (1972). He divided the Ngarluma and Kariyarra groups in contrast with the Ngayarda linguistic bloc: the former falls into a Fortescue River alliance with the Indjibarndi and Martuthunira, and the latter as part of a Yule River alliance. The strong linguistic overlap between the Ngarluma and Kariyarra then provides an interesting contrast to von Brandenstein’s proposal, and the archaeological implications of these two different arrangements are that stylistic similarity within rock art should be consistent according to these alliances. It is possible that these alliances developed after the establishment of the Ngayarda languages (6000 – 3000 kya). Known markers of group identity for the coastal groups such as shield designs are used as a proxy to explore linguistic against cultural connections between these groups.

Similarities and differences between Ngayarda languages can also be seen through cultural practices. For example, the western boundary of male circumcision rites separated the Ngarluma, Kariyarra and Martuthunira, together with the Thalanyji, Purduna, Payungu, Tharrkari, and Jiwarli, from the peoples to the east, including the Nyamal. This can be seen in both versions of Tindale’s linguistic maps (cf. Figs 3.2 and 3.3). In the west, male initiation involved a practice of binding the biceps with a tourniquet. Dench (2001:108; and see Radcliffe-Brown 1913) notes that this ‘arm-tying’ practice united the peoples of the southern Pilbara.

In the Marapikurrinya rock art, there are examples of anthropomorphs where one arm seems inflated, or larger than the other, suggesting this practice. However, the spread of these asymmetrical arms across rock art provinces has not been identified. The anthropomorph shown in Figure 3.4 was identified by a Kariyarra informant in the 1950s as probably representing a young boy, undergoing initiation involving arm-binding (Tindale 1987:51).

In addition to male initiation practices, cultural similarities and regional cohesion between language groups can be identified through shared kinship systems. Throughout the northwest of Australia, two main kinship systems were recorded: ‘Kariyarra’ (also ‘Kariera’) and ‘Aranda’. The Kariyarra system has two patri- or matrilineal lines of descent with the possibility for cross-cousin marriage, and is divided into four groups which order society (Karimera, Burung, Banaka and Palyeri), and originated in the Pilbara ‘near’ current Kariyarra territory (McConvell 1985).
Dench (2001:109) argues that the kinship systems across the northwest, in combination with cultural traits like initiation practices, show that there is considerable cultural continuity across language groups, and like the Ngayarda language family, show regional consistency. Whether this conclusion can be projected beyond 6000 years (with the movement of Pama-Nyungan languages into the Pilbara) is a question which has archaeological implications.

Figure 3.4 Redrawn anthropomorph recorded in Marapikurrinya (Source: Tindale 1987, fig 45)

KARIYARRA

Marapikurrinya (Port Hedland) falls within the Kariyarra cultural and linguistic boundaries (Radcliffe-Brown 1913; Tindale 1940, 1976; although cf. Clement 1903; Dench 2001; Petri and Schulz 1951: who placed the town within Ngarla territory). Tindale (1987) recorded Kariyarra people’s stories about being subject to pressure from the people from the eastern desert interior: Nyamal speakers were said to have forced their way to the sea near Strelley, cutting the Kariyarra off from the Ngarla – their ‘kindred folk’ – creating territorial stress (see Figure 3.3). Atkins (1990) has argued that the area around Marapikurrinya was likely occupied by multiple groups including the Kariyarra, Ngarla and coastal Nyamal people. For the purposes of this research, the boundaries described by Radcliffe-Brown (between Balla Balla and east of Marapikurrinya: Figure 3.5) and Tindale are followed, in line with current connections to Marapikurrinya being recognised as Kariyarra country. It is possible however that Atkins opinion allows for Marapikurrinya to have been a major aggregation locale (see Conkey 1978). It is also acknowledged that groups and their territories will have changed through time, and this research provides some archaeological context or ‘ground-truthing’ to this debate.

Romney and Epling (1958) state that the Kariyarra, prior to European arrival, were a society of about 750 individuals, based on Radcliffe-Bown’s “rough estimate” (1913:146). This population density is considerable, and either is inflated or speaks to coastal resource abundance here. The
larger group was divided into patrilineal family groups of about 30 individuals each, who could be associated with group totems.

**Figure 3.5** Map of the Kariyarra Tribe and Sub-groups (Source: Radcliffe-Brown 1913: 144).

Radcliffe-Brown defined the distribution of family groups' territories (indicated by Roman numerals in Figure 3.5) with the Marapikurrinya harbour falling between Groups VI (Karimera-Burung) and VII (Banaka-Palyeri). Each of these family groups was associated with two of the complimentary skin groups within the kinship system. Radcliffe-Brown recorded no names for these groups, but identified associated totems which belong to the whole group. For example, he associated 14 named fish species, a snake (*Kalunganara*) and the ebb-tide (*Kudunguru*) with Group VI. He associated eight different fish species, a grub (*Kaliwana*, located at Kaliwanana), a snake (*Wanangadi*, located at Wanangadikundina) and two seeds (*Nanungana* and *Tulimalu*) with Group VII, closely linking these groups with coastal/riverine resources (Radcliffe-Brown 1913:162-3).

There are many connections between the culture, language and territory of Pilbara languages. Kariyarra is one language group with its own internal divisions (Radcliffe-Brown 1913), and is connected to other Pilbara languages through the Ngayarda linguistic bloc (Bowern and Atkinson 2012), as well as the proposed Yule River alliance (von Brandenstein 1972). These
alliances present both cultural cohesion and differences, such as recorded in initiation practices (Dench 2001), and evidenced within rock art (Tindale 1987). To understand how the Marapikurrinya rock art fits into this region, matching the chronology of language diffusion, alliance networks and rock art style sequences is critical.

Another interesting aspect about Australian languages, connected to the recorded prevalence of bilingualism and multilingualism, relates to the transfer of mythological narratives across the landscape. These narratives frequently use relict words that link the narrative to a specific place – using the language of the territory of that marker – mixed in with the language of where the story is being told, as well as the speaker’s language (e.g. Tindale 1987; Palmer 1981; von Brandenstein 1972). These connections will now be explored.

**MYTHOLOGICAL NARRATIVES AND THEIR INTERSECTION WITH ROCK ART**

A mythological narrative forms one part of greater ‘religious’ practice among Aboriginal groups in Australia, alongside ritual and song. Myth, rite and song are three avenues for Aboriginal groups simultaneously to negotiate the Dreamtime in the context of past, present and future (Tonkinson 1978). We can see this archaeologically and ethnographically where specific rock art motifs are linked physically to places and relevant parts of Dreaming tracks or songlines on which ancestral beings are also associated (McDonald 2013; McDonald and Veth 2013b). These locales also provide links to individuals and groups who hold ceremonial rights over them (Franklin 2004; Palmer 1981).

Mythological narratives can be enacted and told through song cycles, which create songlines through the landscape. Songlines can follow the direction of travel by culture heroes, demarcate locales within the landscape and trace ancestral tracks - illustrating Dreamtime events and creating and reinforcing a cognitive map for the receiver. Places within the landscape can be used as, and act as mnemonic devices for sacred spaces associated with songlines. There is often a concurrence with rock art production at these places. For example Mill Stream on the Fortescue River is a locale through which multiple songlines pass, is associated with a rain-making ritual, and has a large assemblage of engraved rock art (Clarke et al. 1978; Palmer 1977).

In contrast with the travelling nature of these narratives, rock art is a fixed referent in the landscape, both physically, and persistently through time. Consequently, rock art can function recursively where it is recognised that: “…art can function within a social system as it is produced – and that it continues to function as a mnemonic in subsequent social systems” (McDonald 2013:67). Whilst mythological narratives may inspire rock art, documenting characters and events from the Dreamtime, mythological narratives can also use graphic
elements from existing rock art as referents within the narrative. As pointed out by McDonald (2013), this use can involve rock art from multiple, and distinctly different time and style periods.

**CULTURE HEROES AND ANCESTRAL BEINGS OF THE NORTHWEST**

As a part of this system of ritual and narrative telling, culture heroes/ancestral beings are described in terms of their travels, along with their paraphernalia or ‘portable referents’. For the Mardudjara of the Western Desert this includes thread-crosses (string designs), body decorations and carved boards, which can be produced in emulation of those worn or possessed by ancestral heroes (Tonkinson 1978:106). One example of such a thread cross is interpreted in the rock art of Marapikurrinya by Worms (1954); although McCarthy (1962:34) disagreed with this identification as he could not relocate the motif himself. Similar paraphernalia has been reported for the Kariyarra by McCarthy (1962), particularly sacred boards and bull-roarers. Such ritual paraphernalia can also be identified in various rock art assemblages, through comparison with the physical objects morphology and designs – and where associated with specific mythological figures.

In the coastal Pilbara identified ancestral beings from mythological narratives include the *Minyiburu* (or Seven Sisters), *Thangarra* (Hairy Man), *Marga* (Dreamtime ancestors), *Murra Murra, Marlu* (Kangaroo), and *Mungan Brothers/Wadi Gudjara* (Two Men) (Capell 1949; Eliade 1973; McCarthy 1961, 1962; Palmer 1977, 1981). The *Minyiburu* songline recorded by Palmer (1977) passes from Depuch Island off the Pilbara coast, through Ganya and to Marapikurrinya: and each location has a distinctive (i.e. not stylistically, or necessarily temporally linked) rock art assemblage. There is little ethnographic information in this region linking specific rock art to details from this songline, aside from that provided by Palmer (1977). Consequently, these different strands of information need to be read against each other and tested for their congruence.

Ancestral beings are frequently identified as specific anthropomorphic figures within rock art assemblages across Australia. Examples include Baiame and Daramulan in the Simple Figurative art of Sydney (McCarthy 1958; McDonald 2008); Bunjil in the Grampians (Gunn 1983); and different types of Wanjina across the Kimberley (Blundell and Wooloogodga 2012). At Marapikurrinya the mythological characters that have been identified within the rock art by Kariyarra informant Captain George (1958) in the rock art are *Murra Murra* and the *Minyiburu* (McCarthy 1962). These identifications post-date European contact significantly, and are not supported by other informants. Additionally, these two motif types are unique to Marapikurrinya. However, these identifications are tested in Chapters 4 and 6 through
examination of details within the available narratives including mentioned locations, descriptions of the figures themselves and their associated paraphernalia, and compared with attributes of the engraved motifs (see Chapters 4 and 6).

As a case study the recorded mythological narratives of these two ancestral beings are presented here, in addition to the overlapping story of the Two Men.

**Murra Murra**

*Murra Murra* is a mythological “big man” who has also been identified in the rock art at Marapikurrinya by Kariyarra man Captain George (McCarthy 1962, Figure 3.6). Captain George told McCarthy of a story where *Murra Murra* had run away when the Mungan Brothers (Two Men) showed up in the Marapikurrinya region (1962).

![Figure 3.6](image)

*Figure 3.6* Left: Striped Anthropomorph from Two Mile, identified by Captain George as ‘Murra Murra’, Right: drawing of same motif (Source: McCarthy 1962).

McCarthy recorded a few different accounts of this mythological figure whilst recording rock art at Marapikurrinya in 1958 (MS 3513, AIATSIS) from three informants with Kariyarra, Njangamada and Nyamal linguistic backgrounds.

Captain George called him both Murra Murra and Mandearra, the big striped man, and said he was from the other side of Roy Hill (south-east of Marapikurrinya). He was described as a
headman who convinced his family that the Minyiburu could not kill him because everybody wanted to be his friend.

Major Mackay, a Nyangamarda man from the Great Sandy Desert north of the Kariyarra, called him Torrnbor, and said he came from the south-west. He came with the crow or eagle-hawk whose tracks are shown in some engravings.

Paddy Bolong, a Nyamal man, called him mada mada, or Murra Murra. He reported that he came from a big black hill, near the Peeawah River (located on Munda Station in Kariyarra country - this hill is also an engraving site), and that at the time the hill was surrounded by the sea. Murra Murra came to Marapikurrinya to make rock carvings and then went to live in the desert near a hill. On the other side of the hill camped a half-cast Minyiburu woman, who had pubic hair but no vagina. Paddy Bolong's description of the Minyiburu links them to this narrative, as well as suggesting that this narrative has post-contact elements with the use of the term 'half-cast'.

These accounts provide very limited information about this ancestral being, but summarise that this was a tall male figure, who came from elsewhere – somewhere to the south – and has been associated with the eagle hawk and Minyiburu. Amongst the rock art, this figure has been linked to a specific anthropomorph type at Marapikurrinya, as well as engraved bird tracks.

**Two Men**

There are multiple accounts of Two Men mythological narratives along the Pilbara coast, travelling inland to the Western Desert, and to the north. They are variously named the Mungan brothers or Mungan-Bagadjimbiri (McCarthy 1962; Palmer 1981), Two Men, and Wati Gudjara as they get closer to the desert (Tindale 1936; Tonkinson 1978). Recurring themes associated with these ancestral beings is that they are physically very tall and thin, are often referred to as brothers, Lizard Men from different kinship 'sections' (where these sections are connected to lizard totems), and that they travelled through the landscape dispensing the law – including male initiation rites.

According to McCarthy (1962) – whose informants were Kariyarra, Nyangamarda and Nyamal men – the Mungan Brothers mythology was brought into the Marapikurrinya region by the Nyangamarda. He suggested this mythology replaced 'older' Minyiburu mythology. McCarthy does not conclude whether this replacement was in living memory, or from the deeper past, and does not allow for these narratives to be concurrent. If the Minyiburu mythology were replaced, as he suggested, this should be visible in the rock art through destruction or negation of Minyiburu motifs, through superimposition for example. Additionally, in the more recent rock art Two Men motifs should proliferate, potentially identifiable by the detailed paraphernalia they wear and carry, as described below (however, see McDonald and Veth 2013b).
The Nyamal version of the story is as follows: the two brothers were called Mungan, and they came out of the ground at a place called Bagadjimbiri on the Anna Plains in the desert. They were big men with red paint on their chest and bellies, wearing a human hair belt (ngurrrirri), pubic fringe made of opossum or kangaroo twine (mundiljirri), and armlet made from the same material, and a sacred stick worn through the hair or on a headband across the back of the neck (djilburri), and a headband made of fur twine. They both carried a sacred board (pulliwinna) which they left in each place they visited (McCarthy 1961:423).

The Nyangamarda version of the story names them Wati Gudjara, and attributes them with the introduction of circumcision, sub-incision, boomerangs, straight spears, the fire-plow, the four-section system, bull-roarers, churingas, the thread cross, and various songs and ceremonies (D.S. Davidson cited in McCarthy 1961:424). However, the introduction of these things is not uniform across all of the Pilbara (noting the division of where circumcision was found at European contact – see Figures 3.2 and 3.3).

Palmer’s (1981) account of the Two Man myth includes Nyamal informants, and has them as brothers named Duwaramade and Balindjamada. They are described as very tall and thin, travelling down the Fortescue River performing rituals at certain places, with their travels ended at Depuch Island (1981:365). They created numerous renewal sites (Thalu), spread a new ritual system known as bundud associated with male circumcision, and instigated circumcision or non-circumcision by ‘testing’ various groups. The Two Men also met with other mythological characters including Djagamara (a rainmaker associated with several water sources in the Great Sandy Desert) and the Minyiburu (1981:373).

There are accounts of the Two Men marking the country (as reported by Palmer 1981), by painting on the rocks at Liralira (in Nyangamada country). The stated purpose of their drawing these images was to show novices the correct body markings for ritual, and to demonstrate the course of their travels (1981: 380). Nyangamarda and Nyamal informants identified the Two Men in different rock art assemblages – not at Marapikurrinya – but including Depuch Island: a site where their journey is said to have ended, and a location also strongly associated with the start of the Minyiburu songline (Palmer 1977; Ride and Neumann 1964).

**Minyiburu**

*Minyiburu across the Pilbara*

The *Minyiburu* are ancient Dreamtime beings, most frequently identified as women, who have travelled through the landscape making laws and leaving their mark in certain places and in multiple ways. These marks include rock art, particularly their footprints (engravings), bivalve shells (shell middens), and association with specific landforms that have been metaphysically
transformed (McCarthy 1962; Palmer 1977). From the Pilbara, Kariyarra, Nyangamada, Indjibarndi and Ngarla informants provide different accounts of their narrative, which are summarised here.

Nyangamada informants told Palmer (1977) that they were Dreamtime women who travelled out from Depuch Island, heading east, meeting the Dingari men, whose law they formulated;

They were girls, you can see their tits you know, and just real strip naked, and they just colour between us, like quarter, you know, very fair...they were, er, some magic of some kind, see, because...they made all kind of song, very secret song... (Palmer 1977:40)

In contrast, Palmer’s (1977) Indjibarndi informant indicated that the Minyiburu were ordinary women living on Depuch Island, who lived in the Dreamtime epoch but who weren’t spirits.

Ngarla informants told McCarthy that the Minyiburu were a water people a long time ago. Pandingana was one of them, and his wife was Ngabunbunna, who stayed in the hill country with reliable water. Pandingana left two women in one place, and two in another, and two other men found these women to make the first people (McCarthy 1962:26).

McCarthy also worked with two brothers named Clarke who lived in Marapikurrinya. They provided information that the Minyiburu were women who danced in the Warrawagine and Nullagine districts where their footprints may be seen on the rocks. Captain George identified slender intaglio human tracks amongst the Marapikurrinya rock art assemblage as those of the Minyiburu.

Captain George and Njerburg (also Kariyarra) linked the Minyiburu with the stingray or stingray clan (many stingray depictions occur in the Marapikurrinya rock art: McCarthy 1962):

The stingray was a Minyiburu, a “mob” who come from the other side of Willearra. They camped near the well on a night of the full moon when the sea came up all over the flats and surrounded the limestone ridge. They asked the Kariyarra how to get away, the Kariyarra showed them the way when the tide went out. Some of the Minyiburu went back to their country, brought their women back with them. There was a big quarrel over the women, and the Widdagurrie [Nyamal-boundary] group of the Kariyarra win a fight against the Minyiburu and drove them away. A Nyamal man stole a Minyiburu girl, and the Minyiburu [indecipherable] to either light their poison fire and let the smoke blow on the Widugurrie and kill them all, or meet them in a fair fight. The Nyamal won the girl he stole...brought...their allies from different parts of the country. The fight began and was being won by the Minyiburu with their kaili ‘boomerang’ spears when two left-handed kaili throwers of the Widagurrie killed the headman (‘currawaadi’) of the Minyiburu by hitting him on the forehead with a kaili. This fight took place on flat
ground near Peeawah Hill, a prominent hill near the Peeawah River, on Tuenda side. The Minyiburu were driven into the sea where the two dogs had turned to stones. A clever medicine man of the Minyiburu lifted the sea to... and saved them, and they are still living [near the Marapikurrinya jetty]. (McCarthy Manuscript, 1958:np)

The Widagurrie, referred to in this narrative as a group within the Kariyarra, have also been referred to as light Nyamal speakers (Radcliffe-Brown 1913) who lived around Nullagine, a place also associated with Minyiburu (McCarthy 1962). The *kalli* boomerangs described in this narrative have been identified in the Marapikurrinya engravings by Tindale (1987), who worked with local informants around the same time as McCarthy (see also Harper in press).

The *Minyiburu* are linked to other material culture, being recorded as carrying sacred boards called *minburr* or *minburu* on which they carried the law (Palmer 1977; von Brandenstein 1972). Sacred boards are used by many of the coastal and inland Pilbara groups, and associated with different designs by language group. For example, Captain George gave McCarthy a Karadjeri board with an interlocking key design (1962). Piddington reports that for the Karadjeri the *minburu* was a large bull-roarer used in different rituals, including the *Bilianu* (Piddington 1932), and is associated with *Ngudjowur* and *Dimbildimbil*, the northern Karadjeri names for the Two Men. Petri and Schulz (1951) have linked the 'minboru', which they refer to as a wooden sword, with an anthropomorphic engraving in Marapikurrinya. They label the figure 'Mindjibururung-Brere', or mythical Kurangara man, linking the minboru with Kurangura, another mythological tradition that has been argued to travel into the Pilbara from the desert and further north. These connections show a complicated network of relationships between different narratives, ancestral beings and their objects.

Tindale (1987), writing of the Kariyarra people from the wider Hedland area, noted that the old engravers were the ‘Minjubururu’ or ‘Axe’ people. His Kariyarra informant Kundjing said that the ‘Minjubururu’ were people like the Kariyarra who came from the south a long time ago, who came to Marapikurrinya looking for water. He reported that some died there, and others on Depuch Island. Tindale connects this word with the Njangamada term *minjururu*, a black volcanic rock used for their axes. He links this with two types of hafted stone tool found in the Marapikurrinya rock art, and still in use amongst the Kariyarra in the 1950’s. Interestingly, several grinding grooves located near the engravings may be axe grinding grooves.

**Minyiburu and the Seven Sisters**

The *Minyiburu* are in many mythological narratives also known as, or connected to, the Seven Sisters mythology (Tonkinson 1974; McDonald 2013), and their connection to the Pleiades constellation. Dependent on the telling, these are either two distinct narrative traditions, or
have been combined or potentially amalgamated. The Seven Sisters is a ‘macro-mythology’ (Rose 2013) which can be traced across the continent.

Nyamal, Ngarluma and Indjibarndi informants provide examples of distinct Seven Sisters stories from the Pilbara (Tonkinson 1974; von Brandenstein 1970). There are Nyamal stories of the creation of the Seven Sisters constellation, which was once a woman who died after the mythological Nightjar slept with her after placing a scorpion on his penis. When she died, he threw her body into the sky which became the Seven Sisters or Pleiades (Palmer 1981).

Work undertaken by von Brandenstein in the Pilbara with the Ngarluma and Indjibarndi presented a different version of the Seven Sisters mythology, known as the Kurri Kurri, which is distinct from the Minyiburru. The Kurri Kurri are associated with the Pleiades, and bring out the cold, singing indecent and tempting songs to young girls (1970a). Alternately, the Kurri Kurri may represent different ancestral beings how also interacted with the Pleiades.

In the Western Desert the Minyiburru are also known as the Seven Sisters: a group of Dreamtime women pursued eastwards by the rapacious Njiru, famed for his huge penis. This mythology is reported as intersecting with and/or overlapping with other major ancestral beings the Wati Gudjara and Marlu (Kangaroo-man) (Tonkinson 1974:71).

These various mythical narratives, when read together, show how far they travel through the landscape and through cultural blocs, interacting with people, place and marks in the landscape.

From these different sources, the Minyiburru can be summarised as either mythological women, or a people from the distant past, who like the Two Men travelled far across the Pilbara and into the Western Desert. These figures are linked to water, stingrays and material culture including axes, kalli boomerangs and sacred boards. Minyiburru are connected to rock art through depictions of footprints, and mention of their travels through several locales that contain rock art, such as Marapikurrinya and Depuch Island.

Mythological Narratives Summary

Of particular interest from these mythological narratives are the Minyiburru and Murra Murra culture heroes. These two figures are presented as ancestral beings connected to the Northwest (see Figure 3.7), evidenced by their inclusion in mythological narratives from different language groups, described as travelling across the Dreamtime landscape, and leaving their marks. Of interest for this research are those tellings of the Minyiburru and Murra Murra mythologies by Kariyarra speakers: Captain George, Njerburg and Kundjing (McCarthy 1962; Tindale 1987). As identified by Palmer (1977) in the 1970s there was very little work in the Northwest linking
mythological narrative with rock art. Since then there has been little analysis of this sort within the Pilbara.

![Figure 3.7](image_url)

**Figure 3.7** Mentioned locations of the Minyiburu, Murra Murra and Two Men, and identified rock art locales (Source: redrawn figures/icons from McCarthy 1961, and 1962)

Whilst they have been identified by one Kariyarra informant as being represented within the Marapikurrinya rock art, this identification was made significantly after European contact/invasion and disruption (1958, from McCarthy 1962), and is not corroborated by other sources. Elsewhere in the Pilbara, these figures have not been linked to specific figurative anthropomorphs. The anthropomorphs they are identified with at Marapikurrinya are argued to be unique, and hyper-localised to this rock art repertoire (but see McDonald and Veth 2006).

In order to interrogate the veracity of Captain George’s identifications, the engraved versions of these figures will be analysed considering information provided within these narratives. This takes a literal interpretation to how these figures may be presented in rock art by looking at: sex/gender, associated material culture, size, and relation to other mentioned figures i.e. footprints and stingrays. Additionally, when addressing the claim made by McCarthy that the Two Men supplanted Minyiburu mythologies for the Marapikurrinya area, the proposed Minyiburu figures are examined to reflect this change e.g. superimposition of specific motif types such as weapons or other anthropomorphs.

The material culture, introduced here in relation to mythological beings, is now be discussed in detail, particularly how it relates to the Marapikurrinya repertoire.
Material Culture of the Northwest

Material culture, including shields, boomerangs, spears, spearthrowers, woomeras, sacred boards, rope, bags and axes, features strongly in Marapikurrinya rock art. Material culture is referenced in mythological narrative focussing on objects carried by culture heroes, or objects associated with ritual. Physical examples of these objects have been collected through the Pilbara from contact into recent periods. Shields and boomerangs have detailed design patterns both in material culture collections and engraved motifs. Shield engravings with distinct designs are a distinctive component of the Marapikurrinya engravings. These engraved motifs are different to other Pilbara rock art regions, where shields are represented as schematic, and lack the detailed design vocabulary.

Shields were still being made traditionally in the Pilbara at European contact, and this practice continued through the 20th century, with some shields being produced for the collector’s market. Collected shields available for study vary both morphologically and in designs. Often there is little provenience available.

Ethnographic and ethnohistoric research of shields and shield designs has been undertaken across the northwest by Akerman (1993) and von Brandenstein (1972). Von Brandenstein’s (1972) study of symbolism in the North-West of Australia focussed on zigzag design patterns, which are found on shields, spear-throwers, ‘swords’ and woomeras. His work included interpretations by Ngarluma man Robert Churnside. Churnside told von Brandenstein that the zigzag design could tell you where the shield came from, indicating a clear connection between design and origin. Churnside used local words like ‘straight’ and ‘bend’ when discussing the designs, leading von Brandenstein to interpret the designs as related to specific Pilbara river morphologies, and consequently territoriality.

Akerman (1993) has extensively researched material culture from the Murchison River to the Western Australian Goldfields through to the Kimberley, providing a comprehensive summary of North-western shield designs. Wunda shields dominate across the Northwest, and are found as far east as Ooldea in South Australia. This shield type is flat or slightly curved and oblong shaped, with raised grip handles, are usually made of Hakea lorea (cork tree) or Brachyhiton gregorii (desert kurrajong), and marked with longitudinal zigzag designs in sets of three (Figure 3.8 and 3.9). This shield type originates between the Gascoyne and Murchison Rivers, to the south of the Pilbara. In Kariyarra country, between the Ashburton and De Grey Rivers, the shields are known as Karrgurrka (four zigzags) and Wanparda (five zigzags): these are produced in the same shape, but are larger. Shields produced from further north are heavier, made of eucalyptus hardwoods, and have distinctly different designs, such as interlocking key
motifs. Akerman (1992) also describes shields coming out of the desert, made of beanwood, which were decorated with lateral banding.

These distinct designs and the range of woods used in their production provides vital information about where these shields are initially made, and indicates where they were traded. Known movements of these shields can be seen in Figure 3.9. We know that shields were traded great distances, and that distinct designs can be used to say something about the culture of where they were made. Consequently, shields and their designs should be excellent proxies for group and local identity, given that these are carried in highly public ways by individuals. Difficulties in ascribing local or individual identity from shield designs result from the fact that these are wooden (and hence impermanent), that they are portable, and that we have often poor provenancing of collected shields.

![Example of Pilbara Shield](Source: Western Australian Museum)

The Western Australian Museum collection includes 32 shields with a ‘Northwest’ provenance, of which three were collected in Marapikurrinya between 1897 and the 1960s (Figure 3.10). This collection was examined and photographed for this research. Twelve different designs were recorded across these 32 Northwest shields, with the most common design (n=15) amongst matching Akerman’s (1993) wunda shield, with three longitudinal zigzags (Figure 3.8; 3.9). Of these 32 shields, 26 (~ 80%) were zigzag designs, with various numbers of bends. There were three laterally banded shields, and three unique designs.

From the three shields provenance to Marapikurrinya (Figure 3.10), two shields had zigzag designs, one with five bends (#A25692), and one with eight (#A23477), on their front faces. The back face of the eight-bend shield has chevron patterning on its ends, and a central thick band: this shield was collected in 1968, and uses an array of traditional and modern pigments.
This research will make a comparison of physical shield designs and those found in the rock art, to explore a different group identity marking to that within the material culture (see chapter 6). Particularly, the Kariyarra Kagurraga ('Yule River', 4 bend zigzag, Akerman 1992; von Brandenstein 1972) design will be checked against engraved designs. This analysis will supplement the context provided by mythological narrative and culture heroes who are

**Figure 3.9** Known shield types, designs and movement in Western Australia (Akerman 1993: 19)
associated with these objects, as discussed above. Mythological narratives and material culture are two different lines of evidence which can be activated to explore Kariyarra identity.

Figure 3.10 Examples of shields collected from Marapikurrinya in the 20th Century (Source: Western Australia Museum; Scale = 10cm)

SUMMARY

The cultural context for Kariyarra rock art production is provided by the distribution of Pilbara languages, customs and mythological narratives, and through material culture collections. This cultural context provides a framework for understanding the rock art of Marapikurrinya (Port Hedland). The fact that the rock art is fixed in place, against the progression of time and other cultural changes, is potentially at odds with the recently documented movement of social groups, language, material culture and mythological narratives.

Linguistic patterning in the Pilbara and the recognised language family (Ngayarda) can be mapped against rock art style provinces, with small language alliances (Radcliffe-Brown 1913; von Brandenstein 1972) and checked against shared stylistic practice, such as along the Pilbara coastal rock art provinces. The Kariyarra linguistic bloc – as it is identified at European contact –
contains different rock art styles across the hinterland to the unique and hyper-localised style at Marapikurrinya. However, this style contains numerous elements, and potentially sub-styles, that may link this hub to the broader Pilbara region, as suggested by the Ngayarda language family (Bowern and Atkinson 2012), or Yule River alliance (von Brandenstein 1972). Locking the Marapikurrinya style, or styles, into the framework of language change (arrival and timing of Pama-Nyungan, proto-Kariyarra and Kariyarra proper), may provide more information on either population diffusion or culture contact as the likely cause of Pama-Nyungan language family adoption here.

Across the Northwest both mythological narratives and material culture have rock art correlates. Mythological narratives and the characters recognised as participating in and moving around the landscape in these have been identified in the rock art. The nature and distribution of engraved ancestral beings – and their associated paraphernalia - provide the potential to explore the recursive nature of rock art and its interaction with mythological narratives. Several ancestral beings – in particular the Minyiburu, Murra Murra and Two Men – are described in mythological narratives as being associated with Marapikurrinya. Two ancestral beings – the Minyiburu and Murra Murra – have been identified amongst the engraved Marapikurrinya motifs in the relatively recent times (McCarthy 1962); although the third mythology relating to the Two Men has no engraved analogue there. Other components of the mythological narrative could be linked to engravings, such as descriptions of the Minyiburu leaving their footprints within the rocks, association with stingrays, or the fact that these beings carried sacred boards (Palmer 1977, 1981).

Material culture and the design vocabulary observable in the recent and ethnographic past form a design set which links objects to territory. Of interest here are zigzag designs recorded along the Pilbara coast, and lateral banding designs coming out of the desert. These recorded regional design styles will be tested against those identified within the engraved assemblage. Analysis of design patterns in material culture objects reveals that materialisation of identity is explored in order to identify the role that rock art may have played in portraying cynosuric objects and their congruence (or otherwise) to the physical world.

The patterns found in the engraved material culture items (particularly shields) and anthropomorphic depictions are used to explore how the rock art may have been used to signal distinctive group difference between linguistic neighbours and within the broader culture bloc. The interplay between mythological narratives and rock art production facilitates a better understanding of the recursive role of rock art in the social and symbolic life of the Pilbara.
This chapter provides an overview of Pilbara rock art. Density, motif choice and style(s) of the region’s rock art assemblages are the key factors discussed here, so that the Marapikurrinya engravings can be characterised. Historical and more recent encounters with the engraved art, and previous research and research agendas, will be discussed.

This chapter synthesises what is known about the archaeology of the Pilbara region, and Marapikurrinya in particular. Existing occupation models for the arid zone are presented (McDonald 2015; Williams et al. 2015; Veth 1989a, 1993, 1995), each developed with known local archaeological signatures and predictive modelling. Following this treatment, currently modelled settlement patterns for the Pilbara are discussed, providing the context for the Holocene movements of people, which is the focus of this research.

A predictive model for Marapikurrinya rock art is then presented, building upon existing models for the northwest, and combining rock art evidence with other archaeological material to define the research questions to be addressed by this analysis. Particularly, this model addresses how rock art is marking and negotiating group identity in this region.

**PILBARA ROCK ART WITHIN THE AUSTRALIAN CONTEXT**

Rock art – both engraved and pigment art – is found across Australia and is clearly dependent on suitable rock surfaces. Across the continent an early homogeneous, largely geometric and track focussed engraving style has been identified (Franklin 2004; Maynard 1979; McDonald and Veth 2013), which is superseded in some regions by the development of regionally variable figurative heterogeneous styles in both engraved and pigment art (Basedow 1914; Edwards 1979; Maynard 1979; Mountford 1959, 1960).

Maynard (1976, 1979) developed a tripartite system to explain this early pancontinental phenomenon (see Figure 4.1). Her proposition is a unilinear evolutionary approach: from simple to complex, interpreted as “a long-term trend towards more sophisticated naturalism”, providing a functionalist understanding of how people reacted to change within the environment, and consequent effects on social groups (Layton 1992:14).

By the 1980s, the validity of Maynard’s model was being questioned (Rosenfeld 1988) like McCarthy (1962) had been before her. With increased research, more nuanced theoretical approaches had begun to expand on variable stylistic developments (e.g. Clegg 1987; Franklin
Across the Pilbara most rock art is engraved, with some pigment art found in the hinterland (Mulvaney 2015; Wright 1968). The pigment art has been less well-documented at this point (Wallis 2015), and this appears to lack the complexity and diversity of the engraved repertoires.

Maynard classified the Pilbara sites as a mixture of Simple Figurative, and Simple and Complex Figurative styles (Figure 4.1) with no Panaramitee sites recorded across this region. Interestingly she includes complex styles in the hinterland at sites such as in the Woodstock-Abydos (Upper Yule) (Petri and Schulz 1951; Worms 1954), Black Hill Pool and Juna Downs. In contrast the coastal provinces of Marapikurrinya (McCarthy 1962; Franklin 2004), Depuch Island (McCarthy 1961; Ride and Neumann 1964) and Dampier Archipelago (Mulvaney 2010) (Figure 4.5: #58, 59, 61) are all classed as Simple figurative styles. Her geographic description of the ‘sophisticated’ complex styles is restricted to the coastal regions in the Kimberley (Maynard 1979), which is at odds with reality in the Pilbara. Improved data collection in this region provides strong evidence against the linearity of Maynard’s model, and proves the complexities of the engraved art of the Pilbara.
Pilbara Rock Art

The Pilbara is a large, socially complex and linguistically dynamic region and there is much work still to be done in documenting and researching the rock art regions to finesse our understanding of stylistic groupings and connections between these groups (McDonald and Veth 2009, 2013a).

The first recognition of rock art across the Pilbara, and particularly along the Pilbara coast, came from explorers mapping out the west of Australia, documenting flora, fauna, the landscape, and encounters with Aboriginal people (Basedow 1918; Campbell 1911; Clement 1903; Cleland and Giles 1909; King 1827; Stow 1865; Richardson [in Curr] 1886, Wickham 1842; Withnell 1901).

Some of the earliest recordings of the Marapikurrinya rock art were made at the turn of the twentieth century (Campbell 1911; Clement 1903; Cleland and Giles 1909): some of these explorers witnessed engravings being made on the Pilbara coast (Bates in Layton 1992; Tindale 1987; Withnell 1901). Withnell (1901:29) reported on how Aboriginal people engraved at Roebourne and from this it has been inferred that he saw people making engravings:

...the method adopted is to draw the outline with chalk or ochre and with a sharp hard stone hammer within the outline until the rock is fretted away about one-eighth of an inch deep;

A more definitive example is provided by Daisy Bates referencing her time in the region, in the early twentieth century (cited by Layton (1992:137) as Vol. 9 of collected papers held at the NLA), who wrote:

The present day natives of Balla Balla and Port Hedland [Marapikurrinya] continue their artistic productions on the remaining rocks of Depuch, and on those parts of the sandstone ridge [at Marapikurrinya] which have not been touched by traffic...

Tindale was shown a fresh engraving, while working in Marapikurrinya in 1953 (Tindale 1987; also in Layton 1992:21). His informant was Nyangamarda man Jabili (or 'Dick') who stated that the engraving was made on the 19th of May of that year. Tindale (1987:54) recorded the engraving as a 'shield with maini marks, length 95cm and circular totemic design ngorinj minburu' (see Figure 4.2).

These accounts, combined with the content of the Marapikurrinya repertoire (see below), provide a strong argument for the ongoing creation of rock art in the coastal Pilbara up until recent times.
Pilbara Style Provinces

As a result of the complexity and diversity seen in the engraved repertoires, style regions have been proposed across the Pilbara (Figure 4.3).

Figure 4.2 Marapikurrinya Shield and Totemic Design (Source: redrawn from Tindale 1987, Figure 114)

Figure 4.3 Map of the Pilbara with linguistic groups, major rivers and rock art sites/stylistic regions (from McDonald and Veth 2013a: Figure 2), showing anthropomorphic stylistic diversity (Source: redrawn from Wright 1968 and Mulvaney 2015).
Few systematic studies have been undertaken across the Pilbara to compare these proposed rock art repertoires, or explore connections across the region (see McNickle 1984; Piercy 2011; Wright 1968; and the more recent review by McDonald and Veth 2013a). More common are detailed studies of style provinces such as Murujuga (the Dampier Archipelago: Lorblanchet 1983, 1992; McDonald 2012; McDonald and Veth 2009, 2011; Mulvaney 2006, 2010, 2015; Vinnicombe 1987, 2002; Virili 1979), Depuch Island (Crawford 1964; McCarthy 1961; Minchin 1986), Marapikurrinya (Crawford 1972; Franklin 2004; McCarthy 1962; Palmer 1975; Petri and Schulz 1951; Tindale 1987) and Woodstock-Abydos (McDonald 2012; Petri and Schulz 1951, Worms 1954). The size and complexity of these provinces needs to be recognized, and without detailed systematic recording and research, many bigger questions cannot be resolved. A consistent theme of Pilbara recording work is the attention given to anthropomorphic depictions.

An early fascination with Pilbara research was the possible spread of Kurangara rituals out of the deserts and their perceived presence in particular rock art styles (i.e. Woodstock-Abydos; Crawford 1972; Worms 1954; see also McDonald 2012). The term was applied initially by Worms, connecting the songs and mythologies of particular rituals with exaggerated copulating figures in the rock art. This kind of explanation seeks to find a cause for the development of intricate figurative styles, described as:

These north-western figures...are an astonishing step forward in artistic style...and the inspiration which produced such a revelation in aesthetic values and manual skill must have been a powerful psychological and religious movement or cult. (McCarthy 1962:vii)

In part the focus on anthropomorphs can be seen (Figure 4.3), as resulting from the obvious stylistic variation across the Pilbara in the ways that artists have depicted people: providing a direct link into discussing difference (e.g. Crawford 1972). However, this figurative focus may have obscured more nuanced variability which is evident amongst the geometric and track repertoires of the region. It may be that the track and geometric repertoires across the Pilbara are more persistent and homogeneous than the more obvious differences in human and animal depictions (and see McDonald 2008; who found tracks figure more strongly than proposed by Maynard (1979) for the Simple Figurative Sydney Basin style).

Wright (1968) recorded 4,845 motifs across the Pilbara Style provinces (see Tables 4.1 and 4.2). He found variations between site size and density (total motif counts), and differences between frequency of motif class and subject (Table 4.2, Figure 4.4).
<table>
<thead>
<tr>
<th>Motif Class/Subject</th>
<th>Count</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anthropomorphs</td>
<td>1856</td>
<td>38.3%</td>
</tr>
<tr>
<td>Animal Tracks</td>
<td>1033</td>
<td>21.3%</td>
</tr>
<tr>
<td>Geometrics</td>
<td>910</td>
<td>18.8%</td>
</tr>
<tr>
<td>Zoomorphs</td>
<td>423</td>
<td>8.7%</td>
</tr>
<tr>
<td>Human Tracks</td>
<td>268</td>
<td>5.5%</td>
</tr>
<tr>
<td>Boomerangs</td>
<td>148</td>
<td>3.1%</td>
</tr>
<tr>
<td>Spears</td>
<td>106</td>
<td>2.2%</td>
</tr>
<tr>
<td>Marine Zoomorphs</td>
<td>18</td>
<td>0.4%</td>
</tr>
<tr>
<td>Shields</td>
<td>16</td>
<td>0.3%</td>
</tr>
<tr>
<td>TOTAL</td>
<td>4845</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

**Table 4.1** Motif Class Count and Frequency from all Sites (from Wright 1968, Table 4)

<table>
<thead>
<tr>
<th>Anthro</th>
<th>Zoomorph</th>
<th>Reptiles</th>
<th>Birds</th>
<th>Eggs</th>
<th>Tracks</th>
<th>Weapons</th>
<th>Other</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper Yule R.</td>
<td>715</td>
<td>71</td>
<td>115</td>
<td>24</td>
<td>25</td>
<td>1137</td>
<td>135</td>
<td>785</td>
</tr>
<tr>
<td>Cooya Pooya</td>
<td>371</td>
<td>8</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>11</td>
<td>30</td>
</tr>
<tr>
<td>Black Hill Pool</td>
<td>143</td>
<td>21</td>
<td>4</td>
<td>23</td>
<td>4</td>
<td>21</td>
<td>22</td>
<td>21</td>
</tr>
<tr>
<td>Hamersley St.</td>
<td>135</td>
<td>22</td>
<td>8</td>
<td>4</td>
<td>0</td>
<td>20</td>
<td>32</td>
<td>21</td>
</tr>
<tr>
<td>Hooley St.</td>
<td>111</td>
<td>7</td>
<td>8</td>
<td>3</td>
<td>0</td>
<td>13</td>
<td>24</td>
<td>29</td>
</tr>
<tr>
<td>Chiratta St.</td>
<td>110</td>
<td>26</td>
<td>2</td>
<td>4</td>
<td>0</td>
<td>26</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Sherlock St.</td>
<td>32</td>
<td>2</td>
<td>7</td>
<td>4</td>
<td>0</td>
<td>65</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Nunyerry Ck.</td>
<td>74</td>
<td>6</td>
<td>2</td>
<td>7</td>
<td>0</td>
<td>0</td>
<td>19</td>
<td>5</td>
</tr>
<tr>
<td>Gregory Gorge</td>
<td>61</td>
<td>1</td>
<td>0</td>
<td>5</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Pirina</td>
<td>49</td>
<td>6</td>
<td>0</td>
<td>3</td>
<td>7</td>
<td>0</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Juna Downs</td>
<td>31</td>
<td>10</td>
<td>0</td>
<td>3</td>
<td>0</td>
<td>1</td>
<td>4</td>
<td>10</td>
</tr>
<tr>
<td>Cape Lambert</td>
<td>6</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>24</td>
<td>3</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>Croydon St.</td>
<td>9</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Pyramid Hill</td>
<td>9</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>TOTAL</td>
<td>1856</td>
<td>182</td>
<td>153</td>
<td>86</td>
<td>65</td>
<td>1296</td>
<td>270</td>
<td>937</td>
</tr>
</tbody>
</table>

**Table 4.2** Motif Count by Wright’s classes/subjects and Site

Most of his site data comes from the Upper Yule River sample (N=3007, 62.3%), and six of his sites include fewer than 100 engravings. The Upper Yule engraving sample includes 24% tracks, and 26% classed as ‘Other’, which are largely comprised of geometric motifs.
These tabulations demonstrate clinal variation between sites when anthropomorph frequency is compared to track and geometric (‘Other’) motifs (see Figure 4.4). There is some spatial patterning observable between style provinces: Cooya Pooya and Gregory Gorge, both with high frequencies of anthropomorphs, are immediately inland from the Dampier Archipelago. Conversely, Sherlock Station and Upper Yule, which share similarly high frequencies of track motifs, are geographically dispersed: the former is close to the current coastline and the latter in the uplands. There is no clear pattern connecting the coast, hinterland and track marking, and this may well be the result of sample-size differences. This relationship between track and geometric elements, and figurative motif classes, is explored in the Marapikurrinya repertoire.

![Figure 4.4 Frequency of motif class and subject by site from Wright (1968, Table 3)](image_url)

McDonald and Veth’s (2013a) formulation of arid zone rock art sequence included the larger samples from Wright (1968) data, with additional information around the Murujuga/Dampier Archipelago province (JMCHM 2006; McDonald and Veth 2009). They undertook multiple component analysis of these Pilbara assemblages to quantify similarities and differences between Western Desert and Pilbara rock art styles. They found that the style of anthropomorphic depictions provides evidence for a significant component of the stylistic variability between Pilbara rock art provinces. They argued that via isochrestic style choices (Sackett 1990) broad-scale cultural identity is being signalled across the Pilbara uplands, in
contrast with local group-identifying behaviours seen along the Pilbara coast (at Chiratta and Murujuga), and the eastern Pilbara (Juna Downs) (2013:77).

**MARAPIKURRUNYA ROCK ART**

Marapikurrinya has already received significant research attention, with the art being recorded by many researchers (Basedow 1918; Campbell 1911; Cleland and Giles 1909; Davidson 1936; Elkin 1949; McCarthy 1962; Petri and Schulz [and the Frobenius Institut] 1951; Rose 1950; Tindale 1987; Worms 1954), but only analysed by a few (Franklin 2004; McCarthy 1962). In addition, many of these previous studies were not systematic and there remain gaps in our knowledge of this art province.

The first written account of the Marapikurrinya engravings is provided by naturalists Cleland and Giles, who travelled to Marapikurrinya in 1907 to investigate an infection in the camel population:

Port Hedland [Marapikurrinya] itself is of little interest, being merely a sandy island almost without vegetation, cut off from the mainland by mangrove creeks. However, on a flat limestone ridge bordering one of these creeks and quite close to the town are a number of rough native carvings chipped with much labour on the horizontal surfaces...Many of the carvings are complicated and symbolic, others represent emu-tracks and spears, still others fish...and turtles. (Cleland and Giles 1909:46)

Campbell (1911) spent a day ashore at Marapikurrinya, and recorded some engravings also at Two Mile Ridge (Figure 4.5). In his publication, he identified the urgency for recording work to take place on this engraved art while people who held cultural information were still around to be interviewed. Fifty years later, this sentiment was repeated by McCarthy (1962).

Campbell believed the engravings to have some time depth. He identified potential ‘deity’ or mythological figures without reference to support this ascription (Figure 4.5: #2 and 30; the same identified later as *Minyiburu* by McCarthy (1962), items of material culture (including spears, kylies, woomeras, dilly bags, shields, fishing lines and hooks (Figure 4.5: #1), marine fauna including sharks, seals and turtles, plants (Figure 4.5: #11 and 13) and scenes including ‘skate’ fishing.
Basedow (1925) provided sketches like Campbell’s, focusing largely on outline style motifs: anthropomorphs, marine fauna, material culture, tracks and geometrics (see Figures 4.6-4.8). These images are not geo-referenced and while most are consistent with those recorded by McCarthy (1968), his recordings include additional anthropomorph types and shield designs not found elsewhere across Marapikurrinya.

Figure 4.6 Redrawing of Basedow’s drawings of ‘Rock Carvings’ at Marapikurrinya (Source: Basedow 1925: 300, Fig. 10)
Basedow’s recordings were informed by Aboriginal interpretations given to the handful of the motifs he recorded (Figure 4.6-4.8). One geometric motif was described as a shark’s liver, and one as a corroboree plume. He describes the anthropomorphic figures (as does McCarthy 40 years later), being depicted to suggest movement or dancing (1925: 302). Interestingly, two of Basedow’s recorded anthropomorphs (Figure 4.8) have rare features not seen elsewhere in the Hedland recordings: they are depicted with their footprints (tracks) in place of feet.

*Figure 4.7 and Figure 4.8 Additional Basedow Figures including anthropomorphs, patterned material culture and concentric circles (Source: Basedow 1925: 301, Redrawn Figures 11 and 12)*

Petri and Shultz, of the Frobenius Institut, visited Marapikurrinya between 1938 and 1939, and recorded around 20 outline figures, making notes on associations with different religious cults. This was the first research team to the region to include female researchers. Their recordings were made near the ‘Native Hospital’, in the centre of the current township, and along the main Two Mile Ridge.

Their recordings focussed on anthropomorphs and material culture, and aimed to understand the socio-cultural aspects of the engravings. Their photographic notes connect Minyiburu figures with the Kurangara cult. Their research, as with Worms (1954), made connections between mythologies, associated ritual and anthropomorphic figures, which they perceived as depicted through sexual intercourse between anthropomorphic figures. They also remarked on the presence of spiral and concentric circles (Figure 4.9) as being sacred central desert motifs, commonly associated with material culture used in secret-sacred ceremonies. They suggested that the presence of these in Marapikurrinya may result from “stimulative influences reaching their creators from desert tribes living far away” (translated, 1951:79).
Worms (1954) refers to Marapikurrinya as the Bilba-ra, which may be a mistake, confusing the name of the township with the broader 'Pilbara' region. Working with (unidentified) informants he writes that the engravings across Marapikurrinya were made by a group called the Mindjebururung, or mani wangu-mele (literally translated as sign-stone-belonging; i.e. 'rock carving people'), who left behind reproductions of themselves on the rocks of the country through which they passed (Worms 1954). He singles out the Minyiburu figures, noting an "...an economy of drawing which I have not observed elsewhere" and argues these dynamic figures are more recent, being superimposed over bulbous, squared and static anthropomorphs representative of older inland art “such as seen at Gallery Hill” (1954:1086). Worms pointed out potential sequencing in the rock art, following on from Campbell’s weathering observations (1911) above, and was the first to draw connections between Marapikurrinya rock art and elsewhere in the Pilbara.

Norman Tindale was part of an Anthropological Expedition team that travelled through the Pilbara in 1953, spending time in and around Marapikurrinya (Tindale 1987). He writes that the Marapikurrinya engravings have been "cut into the rock by earlier generations of Aborigines whose ideas appear to have been sufficiently close to those still held today that Kariara [Kariyarra] people of the present generation are able to make interpretations of the intentions behind the ancestral work" (1987:43), and generally that the engravings were produced by a pre-Kariyarra people (the ‘Minyibururu’ or ‘Axe-people’) on the rock surfaces eroded by prior high sea levels.

Tindale and team recorded an area approximately 500 by 50 metres, close to the ‘Native Hospital’ (like the Frobenius Institut team), and at that time Aboriginal people were camping on top of the engravings. Their team included Aboriginal informants, and their main informant was a Kariyarra man named Kundjing. Kundjing identified different material culture items such as a
wooden boomerang used in fishing, and named marine animals, as well as male and female anthropomorphs (Tindale 1987). Tindale’s interpretation of motifs was economic: with animals perceived as either prey or as dangerous. He recognised, however, that all his informants were male, resulting in a bias towards identifying male material culture including hunting boomerangs, axes and spearthrowers, while some ‘female’ tools were recorded including a termite mound “beating-club” (1987:46).

Tindale repeated many times that the motifs were open for all Kariyarra to see, going as far as saying that for the Kariyarra there were no secret ceremonies (1987:46, 50, 55). He makes a distinction between motifs that are found in the Marapikurrinya repertoire that are known as secret/sacred in other parts of the Pilbara and further inland, and are only safe for initiated men to see. This is an interesting point because it suggests that during the time Tindale spent in and around Marapikurrinya, his Kariyarra informants led him to believe that they clearly distinguished themselves from the broader Pilbara in terms of shared iconographies and cultural practices.

While many researchers have previously recorded engravings around Marapikurrinya, activities were restricted to Two Mile Ridge and the Anderson Street ridge, of which little is left today. These previous recorders have come from varying backgrounds, including avocational researchers, botanists and anthropologists. Most (except for Petri and Schulz 1951) focussed on the anthropomorphs, outline figures and the material culture engravings. Few researchers discussed the extensive track and geometric repertoire prior to McCarthy’s comprehensive (and more systematic) recording. Most of these early recordings included information from Aboriginal informants (none identified as being part of the cultural groups which produced the art), and all worked many years after first contact with European explorers and pastoralists in Marapikurrinya. This previous research consequently leaves both significant gaps, as well as providing some unique information, including twentieth century interpretations of specific motifs.

Temporal markers in Marapikurrinya rock art

There are no direct dating techniques suitable for engravings on the Marapikurrinya exposed calcarenite ridges. As the ridges are largely horizontal surfaces on a cyclonic coastline, no crusts trapping organic materials have formed over engravings, and none of the engraved ridgelines have been buried by dateable sediments or archaeological deposits. Consequently, dating of Marapikurrinya rock art relies on inferential processes, including superimposition of motifs, relative weathering of engravings, changes in sea level (and consequent availability of the ridges in association with resources), and the presence of certain motifs within the repertoire, such as
material culture dated in archaeological contexts, terrestrial versus marine fauna, other animals which can be dated by association (i.e. the late introduction of the dingo; and the presence of post-contact animals, such as horses), and ‘contact’ or historical motifs.

As already discussed (Chapter 1) fluctuations in sea level both created the calcarenite ridges (former coastal dunes) during the Pleistocene (c. 125,000 years ago, when the sea level was last at its current high stand), and created the mangrove, tidal creek and marine environment surrounding these ridges (c. 7000 BP) when sea levels reached their current stand (Baker 2001; Lewis et al. 2013). The faunal component of the Marapikurrinya engravings is marine-based, with turtles, stingrays, whales, dugongs, sharks, and various fish dominating the assemblage. Exceptions to this are lizards, birds, snakes and a single unidentified quadruped; there are no large range fauna such as emu or kangaroos. Complementing this faunal range within the material culture are identified fishing boomerangs (Tindale 1987) and a fishing spear with a line attached indicating rope (Basedow 1925; McCarthy 1962). The Marapikurrinya figurative rock art documents a strongly marine-dominated economy.

Another potential marker in the art is dingo tracks (McCarthy 1962). The arrival of dingoes into Australia from southeast Asia has been determined by two key mitochondrial DNA studies (Oskarsson et al. 2012; Savolainen et al. 2004). The dingo most likely arrived in Australia c. 5000 years ago, with a less probable margin of up to 10,000 years. The archaeological record suggests arrival by 3500 years ago (Gollan 1984; Milham and Thompson 1976), which generally confirms the mitochondrial sequence. The late arrival of dingoes provides evidence to narrow down the production period for engraved dingo tracks. This late Holocene event adds further support to the assumption that the engravings at Marapikurrinya – as part of the broader archaeological record – were made after sea level stabilization from 7000 BP.

The most recent art created at Marapikurrinya is suggested via ‘contact’ and historical engravings. There are a handful of engravings recorded in Marapikurrinya that support the testimonies of Bates (n.d.) and Tindale (1987) that engravings were still being made there in the twentieth century.

It is important to know how recently rock art was being produced and how people who have provided informed views about this art were connected to its production. There is also much to be gleaned from the production of introduced subject matter into the art repertoire. The production of ‘contact’ art, which revealed intimate details about the introduced subject matter, can provide very different understandings about the nature of culture contact (e.g. Frederick 1999; McDonald 2008; Paterson and Wilson 2009; Taçon et al. 2012).
One unique engraving has been argued as non-Aboriginal in origin (see Figure 4.10). Located closed to the Two Mile well, this was first identified as a female figure (Tindale 1987, Figure 4.10). Tindale noted that the technique used to create this motif appears different, where "local opinion ascribes it not to Aborigines, but to someone of a small group of American soldiers belonging to a Navajo special unit that was camped close by during World War II" (1987:45). McCarthy (1962) recorded this figure as potentially engraved by Afghan camel drivers who camped near the well many years prior, also noting that the style is completely different to that of any other human figure recorded.

![Figure 4.10 Left: Unique human form outlined with chalk (McCarthy 1962, Figure Ilg); Centre: 1953 Sketch (from Tindale 1987: Figure 139, retraced); Right: Photo of most visible aspect remaining](image)

Little is known about the Navajo special unit in Marapikurrinya during World War II (cf. Riseman 2012), although there was a large RAAF base located there at this time, which was bombed by the Japanese in 1942 (SMH, 1 Aug 1942: 9). Much more is known about Afghan cameleers in the region. The well at Four Mile is known both as an Aboriginal water source (Puriyakanya) and an Afghan well (Municipal Inventory of Heritage Places #41). Loois (1988) recorded the significant numbers of cameleers living in Hedland, particularly from the 1890's. McCarthy’s explanation is thus more probable to explain this unique anthropomorph as ‘contact art’, indicating interaction between the Aboriginal culture and another.

Aboriginal authored contact art is located at South West Creek 4. This ‘contact art’ is represented by two pairs of U-shapes (interpreted as horse shoes), and three putative boot prints with sole and heel (see Figure 4.11).
This scene depicts a standing horse with booted individual walking towards the horse and then mounting. A heavier pounding technique - different to most engravings at this site - has been used in this composition: although the tool used to create this was stone – not metal. At Inthanoona Station, inland from Cape Lambert on the Pilbara coast, many contact rock art engravings have been recorded (Paterson and Wilson 2009; Paterson and van Duivenvoorde 2013). The contact engravings include anthropomorphs on horseback, frequently with other European paraphernalia like hats, pipes and guns, riderless horses, shoes/boots, boats, and horseshoe shapes. The identification of horseshoe ‘tracks’, and depiction of human tracks in boots fits well into the schematic repertoire of Marapikurrinya, and suggests an early record of Pilbara culture contact.

At publically accessible sites like Two Mile Ridge and Boodarie Landing, there are plentiful modern engraving efforts: graffiti. But there are also more enigmatic examples that appear to have been made using metal tools (which leave a square-shaped groove: Figure 4.16). One of these is a ship with two sails, and possible crew (represented by two short vertical lines: recorded at Two Mile Ridge, Figure 4.16: left). The other is two outlined hands (a motif type
found amongst the engraved corpus) and a date ‘1976’ all with sharply defined edges (Figure 4.12:right). This relatively recent effort is fully patinated: there is no colour difference between the surface of the rock, and the groove. As documented by Atkins (1990), impacts to the rock art in Marapikurrinya include iron ore dust associated with rail transport and storage. As a result, patination (or colour contrast) is of no value in this art body as a relative dating technique.

![Figure 4.12 Left: Boat engraving, Nelson Point; Right: Modern engravings, abraded and incised, Boodarie Landing](image)

**ROCK ART SITES IN AND AROUND MARAPIKURRINYA**

A review of all rock art sites registered by the Western Australian Department of Aboriginal Affairs (‘DAA’) was undertaken for this research. This identified 34 individual sites, many of which are subsites which together comprise Two Mile Ridge (Figure 4.13: see Appendix 1).
Figure 4.13 Known rock art sites across the Marapikurrinya harbour (study sites in white)
This thesis focuses on two sites within the South West Creek site complex located west of the Marapikurrinya township (see Figure 4.13 and 4.14), where few impacts were observed, providing rich and 'intact' samples. Two Mile Ridge, as McCarthy's (1962) core site, is utilised to contextualise these two sites. South West Creek 4 and Mourambine Kariyarra 3 were the focus of the fieldwork undertaken for this research.

South West Creek 4

This site was first recorded by Kingsley Palmer in 1975.

The site covers an area approximately 3200 x 850 metres and its boundaries are defined as the entire tidal island, above the fringing mangroves. It has a maximum elevation of c. 9 metres along the central ridgelines.

The site was initially recorded as a ceremonial and mythological place – without detail as to why – and campsite, with extensive midden and engraving material, stone arrangements, artefact scatters and Potential Archaeological Deposit ('PAD'). Midden material (see Figure 4.15) is predominantly *Anadara granosa*, with low densities of gastropods, *Melo* spp. and *Syrinx aranus*.

![Figure 4.14 South West Creek Sites (Source: NearMap)](image)
There was a notable absence of oyster recorded across the midden. Midden density increases dramatically around ridges and adjacent lowlands where engravings are found: these are more commonly on the northern side of limestone ridges (Warren 1995:9). A fresh water well, or soak, is located centrally along the main southern ridge (Figures 4.16 and 4.17), in close association with dense areas of engraving.

Figure 4.15 Scattered *Anadara spp.* scree and engravings on South West Creek 4 main ridge, west

Figure 4.16 and Figure 4.17 Probable well/soak, with linear vertical bars around the walls (Used with permission: photo –Leslie Zubieta)
**Mourambine Kariyarra 3**

Little has previously been documented about Mourambine Kariyarra 3. Kariyarra man Vincent Lockyer requested this site be recorded, and this was undertaken by heritage consultancy RPS in 2011. A site card was submitted to the DAA, but this site has not yet been registered.

The site covers an area approximately 2900 x 350 metres and like SWC4 its boundaries are defined as the entire tidal island, above the fringing mangroves. Also like SWC4, it has a maximum elevation of c. 9 metres, however there is one central ridgeline for much of the island, splitting in two at the western end.

The site was recorded as including engravings, shell midden (predominantly *Anadara granosa*), PAD, gnamma holes with lids intact and stone arrangements considered to be *Thalu*.

**Two Mile Ridge**

Two Mile Ridge (Figures 4.13 and 4.18) runs through the township of Marapikurrinya, from the original Marapikurrinya jetty, parallel with Wilson Street and the rail line (i.e. built on the highest available elevation above the mudflats) for approximately 6 kilometres (Warren 2001:16).

![Marapikurrinya township with approximate location of original ridges (pink)](image)

*Figure 4.18* Marapikurrinya township with approximate location of original ridges (pink)
(Base image – NearMap)

The site complex was an extensive occupation and engraving site located on a wide, long and relatively low ridge, and includes a freshwater well around the 2 Mile mark, shell midden dominated by *Anadara granosa* (with some fragmented Baler and Conch shell), probable *Thalu*.
stone arrangements, grinding and some scattered lithics. Early recordings (discussed above) are all that remain of parts of the ridgeline. McCarthy (1962) recorded large sections of the (already fragmented) ridge line, from the port through to 'Four Mile' (see Figure 4.19).

![Figure 4.19](image)

**Figure 4.19** McCarthy sketch of Two Mile engravings (vertical lines) with landmarks (1962: Fig 46A)

As a result of many industrial impacts and infrastructure developments, the ridgeline is now divided into smaller registered sites (Warren 2001; Zubieta and McDonald 2015).

McCarthy’s (1962) report remains the most comprehensive record of 2 Mile Ridge. He took a photo of every motif for 120 feet (~36.6 metres) around the 2 Mile Well, and illustrated (sketched) a range of these. While these illustrations are presented in his 1962 report, along with some photos, the bulk of his recordings cannot be located at the Australian Museum. His report documents 6,916 motifs categorised by motif type and technique (Table 4.3).

<table>
<thead>
<tr>
<th>Motif Total</th>
<th>Town to 1 Mile Camp</th>
<th>1 Mile Camp to 2 Mile Camp</th>
<th>2 Mile Well to Manganese Plant</th>
<th>Manganese Works to 4 Mile Point</th>
<th>Road Board Depot to Native Hospital</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOTAL</td>
<td>1,871</td>
<td>279</td>
<td>3,454</td>
<td>642</td>
<td>670</td>
</tr>
</tbody>
</table>

**Table 4.3** Motif counts by McCarthy’s area divisions (summarised from McCarthy: 1962)

These included: arcs, banded designs, bars, barred ovals, bird tracks, boomerangs, bullroarers, circles, crosses, geometric designs, echidnas, echidna tracks, feather plumes, fish, goannas, axes, anthropomorphs, kangaroo tracks, marina fauna, 'Minyiburru spirits', plants, pubic fringes, sacred boards, linear designs, shields, spears, spearthrowers, sword clubs, turtles and stingrays.

**Fred McCarthy’s Sequence**

The large Two Mile dataset was counted, subject to superimposition and broad technique classifications, and McCarthy developed a stylistic sequence for the Marapikurrinya repertoire.
McCarthy’s (1962) fieldwork in Marapikurrinya and other rock art regions across Australia led him to develop a pan-continental four-phase model for engraved rock art. This was (from earliest to latest):

1. Abraded grooves, commonly called sharpening or tally marks: Devon Downs, across the Northern Territory, South and Central Australia, New South Wales and Queensland;
2. Outline anthropomorphs, zoomorphs, and artefacts which (a) in north-western Australia, particularly at Marapikurrinya, Burra in South Australia, and the Sydney-Hawkesbury district of eastern Australia, appear to have diffused or spread around the northern periphery of the continent to the south-eastern region, and which developed into outlines decorated with striped, barred and other line designs at Marapikurrinya and other sites in north-western Australia, and (b) diffused as plain circles (and other motifs not yet precisely defined) from the north-west through the interior to the Flinders Range;
3. Linear designs of concentric circles, pubic aprons, feather plume ornaments, grid, parallel sinuous lines, arcs, and many others, which are distributed from north-western Australia through Central Australia to the Flinders Range, New South Wales and Queensland, west of the Great Dividing Range; and
4. Pecked intaglios of anthropomorphs, zoomorphs and artefacts found in north-western Australia, Central Australia, Flinders Ranges, western New South Wales, and western Queensland. The pecking technique varies from fine pittings hammered in layer upon layer in a figure, to gashed which do not remove the whole surface inside the outline.

McCarthy believed that the change in stylistic repertoires was the result of changes in cult mythologies and rituals, with consequent spread of new associated art motifs (1962:87); “it is important to realise how rapidly the diffusion of these cults affects the art of the local groups and tribes” (Ibid). Phases two and three McCarthy recognised as having similar motif choices, although figurative subjects (such as turtle) were seen to be increasing within the outline barred style, while material culture (spears, spearthrowers and shields) developed in the outline striped and curvilinear styles (1962:2). McCarthy (1962) argued for stylistic change, diffusing from north-western Australia into the interior and south, which he saw as being in the opposite direction from wooden tjurungai moving from the desert tribes in Central Australia through to the north-west.

McCarthy identified changes in tracks by their style and associations. He notes that Phase 2 outline motifs were part of compositions which include life size and gigantic figures, while the Phase 3 linear motifs both the humans and animals cease being associated with tracks, but are
instead associated with symbols. In Phase 4 intaglio motifs, tracks themselves become larger and part of hunting compositions. McCarthy (1962) argues that the transition can be seen in the track repertoire from representation to impressionism, i.e. naturalistic to schematised (and see Layton 1992).

Abraded grooves are placed first in McCarthy’s sequence, but were not observed in Marapikurrinya, and it is probable that what McCarthy called abraded grooves are axe grinding grooves.

McCarthy’s pan-continental sequence chronology has been critiqued (see Chapter 2; e.g. Franklin 2004; Maynard 1979). His Marapikurrinya sequence has had variable uptake. Layton (1992: 10) questioned McCarthy’s approach using superimpositioning to ‘derive sequences of style’. Crawford’s detailed knowledge of the Marapikurrinya and Depuch Island engravings led him to refute McCarthy’s sequence (1972:310). He preferred the Wright (1968, 1977) chronology, which identified that linear figures came after infilled figures.

In 1988 McCarthy provided a defence of his sequence focussed on Marapikurrinya and Sydney. This defence was roundly critiqued (by Clegg, David, Franklin, McDonald, Maynard, Moore, Morwood, Rosenfeld and Bednark: see RAR 1988), with researchers raising issues around superimpositioning, interpretation of abraded grooves, the geology of Marapikurrinya presenting a shorter time window than other rock art provinces around Australia, and the apparent confusion between form, technique and style. The major issue identified was that the Marapikurrinya sequence appeared to invert the sequence of forms seen elsewhere in Australia, specifically the presence of intaglio tracks in McCarthy’s most recent phase of engraving at Marapikurrinya. The current examination of superimpositions across SWC4 and MK3 aims to provide clarity to this debate at a local level.

The remaining archaeological context is now presented, focussing particularly on the Holocene, being the key period of interest for this rock art body.

ARCHAEOLOGY OF THE NORTHWEST

Marapikurrinya (Port Hedland) currently sits on the northwest coast of the Pilbara (Figure 4.20), with the Abydos Plain hinterland behind it. Aboriginal occupation of the Pilbara region is now known to have begun from 45-50,000 years ago (Morse et al. 2014; Veth et al. 2014). Through time the region has experienced significant environmental and climatic change from this initial Pleistocene occupation, through the Last Glacial Maximum and into the Holocene and associated Marine Transgression (from approximately 10,000 years ago). Sea level reached its current height here around 7000 BP (Lewis et al. 2013).
As the result of rising sea levels Marapikurrinya now sits at the same coastal and island interface as Barrow and Montebello Islands (Veth et al. 2014) and the Dampier Ranges (McDonald 2015). These landscapes were once part of a broader coastal plain, with the Pleistocene coastline some 200 kilometres away (see Chapter 1). These locations are each regarded as ‘maritime deserts’, as described and explored by Veth et al. (2014). With the emergence of these maritime deserts in the late Holocene, it is argued there was consequent tension between 'coastal coalescence' and 'interior fissioning' across these landscapes. This recent research moves the discourse away from coastal sites being viewed as purely marine economies. Rather, through the Holocene we are seeing hybrid societies of hyper-mobile groups, able to take advantage of the full suite of both littoral and hinterland resources (Veth et al. 2017). This approach fits well with a seasonal understanding of how Holocene people would have dealt with changing climatic systems including increasing aridity, demographic packing and consequent changes in social group dynamics, such as territorial arrangements and inter-group interactions. Production of rock art within this framework is consequently inferred to negotiate these changes.

**Occupation across the Northwest**

An increasingly detailed picture of Pleistocene occupation of the Northwest is being established, building on early research at Newman Rockshelter which demonstrated earliest occupation at 26,300 cal. BP (Troilett 1982) and Mandu Mandu Rockshelter at 32,000 cal. BP (See Figure 4.20, Morse 1993).

From these early investigations, a major research focus of in the northwest coast of Australia has been the LGM occupation hiatus. Labelled a 'distinguishing archaeological feature' of the region (Green et al. 2006:8), sites where this hiatus is observed includes Mandu Mandu Creek on the Cape Range Peninsula (Morse 1993), Silver Dollar on the Peron Peninsula, Shark Bay (Bowdler 1990) and Koolan Island on the west coast of the Kimberley (O'Connor 1989). However, additional research has led to a more nuanced understanding of the LGM hiatus, and Pilbara sites with LGM occupation have been found, including Yurlu Kankala, and other hinterland sites like Yirra Rockshelter, Juukan Rockshelter, and Milly's Cave (Barbarena et al. 2017; Morse et al. 2014; Veth et al. 2017).
Figure 4.20 Map of Pilbara with archaeological sites mentioned in this chapter (Adapted from McDonald and Veth 2013), with the current and Last Glacial Maximum coastlines indicated.
In their review of Pilbara archaeology Ryan and Morse (2009) make several conclusions about the dates across the Pilbara, as well as the effect on occupation models which may be biased because of a reliance on rockshelter assemblages:

Ethnographic and anecdotal accounts of Pilbara Aboriginal people clearly show that rockshelters were not the focus of human occupation. Rockshelters and caves were used only during rain or dust storms and were sometimes used to cache wooden artefacts and other materials. Sandy creeks and their banks were the preferred location for large scale camp sites with long term seasonal camps located where reliable sources of water could be easily accessed. (Ryan and Morse 2009:6)

With this caution in mind, a review of Pleistocene-aged rockshelters is presented here (noting that none of these shelters include rock art). This discussion provides context for the long-term occupation of the Pilbara landscape, particularly as most these shelters show either intermittent or continued occupation into the Holocene.

Morse’s early Cape Range excavations (Morse 1988) uncovered a wealth of important information for understanding the colonisation and changing occupation patterns along the Carnarvon bioregion. Optimally located where the continental shelf is only 12km from the modern shoreline these excavations provided an early date of 32,000 years ago, with a noted disconformity around the LGM. Baler shell was found in close association with a series of Conus sp. beads (see Balme and Morse 2006), and other decorative items recovered from the late Pleistocene component included ochre, and Dentalium sp. scaphopod beads.

The Pilgonaman shelter at Cape Range had a faunal assemblage with terrestrial species including bilby, bandicoot and macropod dominating, and with a smaller marine species component indicating a supplementary food source. It was suggested that this hinterland shelter acted as an intermittent refuge during the LGM based on water and fauna availability (Green et al. 2006:9; Morse 1993).

Excavation of three eastern Pilbara rock shelters, Kariyarra Rockshelter and Kunpaja Cave in Kariyarra country and Yurlu Kankala in Njamal country (see Figure 4.20), has now provided evidence for early occupation of the Pilbara hinterland, and in Yurlu Kankala occupation through the LGM (Morse et al. 2014). Yurlu Kankala shows the longest Pleistocene occupation sequence (~45-14,000 BP) with a small pulse of recent occupation ~1800-1500 BP. Kunpaja Cave returned the shortest chronology, with dates showing occupation between ~15,000 BP and ~3500 BP. Kariyarra Rockshelter returned both a recent (~2600-2400 BP) occupation sequence, a long absence in cultural material, and an older Pleistocene (~40 – 30,000 BP)
occupation sequence. These sites all provide information for recent occupation during the current Pilbara coastline configuration and the movement of goods during the Holocene. These shelters cover the timeframe of rock art production at Marapikurrinya, and are detailed here.

Yurlu Kankala (Figure 4.20) is the largest of the three caves, with a floor space 20 metres in length, and an entrance measuring 10 by 14 metres. It commands an impressive position within a ridgeline, is elevated and can be seen from a distance, as well as providing panoramic view from within the cave. A permanent fresh water rock pool that measures 50 metres in length, and up to 1 metre deep, is located 500 metres southwest of the cave. Excavations indicate that between 25,000 and 15,000 years ago this rockshelter served as a refuge, with higher quantities of stone artefacts, bone, and charcoal being discarded during this time of heightened aridity (Morse et al. 2014:171-2).

The Kariyarra rockshelter occupation sequences includes a Pleistocene phase (40,021 – 37,662 cal. BP), and a Late Holocene phase (2644-2480 cal. BP). Cultural material included ochre and a tusk shell (decorative) dated to approximately 500 cal. BP. This indicates transport or trade from the coast and a Pilbara hinterland extension for this decorative tradition along the coast from the Kimberley and Cape Range (Morse et al. 2014).

The Kunpaja Cave excavation revealed occupation during the late stages of the LGM and into the late Holocene. This occupation included charcoal and low densities of stone artefacts, but no faunal or other organic remains. Raw material types (including basalt and quartz) indicate long-distance trade through the Holocene, as no local sources of these materials have been identified (Morse et al. 2014: 174).

As more Pilbara upland sites populate the LGM lacunae the predictions for a Pilbara refugium are confirmed (after Hiscock 2004; Veth 1993; Williams 2013). For example, the Hamersley Range in the East Pilbara shows occupation from 32,000 years onwards, throughout the climatic changes of the LGM (Slack et al. 2009). Additionally, with establishment of Pleistocene-aged site occupations on Barrow Island to the west (e.g. Veth et al. 2015), the Pilbara region now has an archaeological sequence in line with elsewhere across the continent (e.g. Clarkson et al. 2015; Fifield et al. 2001; Turney and Bird 2002; Turney et al. 2001). The Pilbara has likely been inhabited since colonisation of the continent, with the Pilbara upland being utilised throughout the LGM hiatus.
**Holocene Coastal Configuration of the Northwest**

Much of the Pleistocene and early Holocene record for the Pilbara coast is now underwater or islandised (see Chapter 2). The rising sea levels that have made the calcarenite ridgelines high points within the Marapikurrinya mangrove creek network are a Holocene configuration. Prior to this, these ridges would have comprised subdued elevations across a broader coastal plain, with a river passing through this area. The majority of archaeological sites identified in and around Marapikurrinya date to the Holocene, and older archaeology is assumed to be now inundated. This is demonstrated by research on continental islands off the Pilbara coastline such as the Montebello and Barrow Islands, and islands of the Dampier Archipelago (e.g. Manne and Veth 2015; McDonald 2015; McDonald and Berry 2017; Veth et al. 2007, 2014, 2017).

The Montebello and Barrow Islands are offshore landscapes. As a result of rising sea levels and increasing distance from the resulting coastline, the islands were abandoned by the mid-Holocene (Veth et al. 2014).

On the Montebello Islands two rockshelters were excavated, Noala Cave and Hayne’s Cave, with dates returning an occupation sequence from 31,273 to 8327 cal. BP (Veth et al. 2007). The archaeological evidence suggests sparse and episodic occupation of the caves (however, see Ryan and Morse 2009), and provide information on how people changed their diet within the context on an encroaching sea. Between 10,000 and 8300 cal. BP a significant marine component is seen in the faunal remains, at the same time as exotic stone types are disappearing from the record. These factors are argued to be linked to the final phase of the marine transgression, during which the land bridge that connected these islands to the mainland was lost, with new economic strategies implemented.

Barrow Island, a much larger landmass than the Montebello Islands, and now located 50 kilometres offshore, has been the target of a recent large Australian Research Council project – the Barrow Island Archaeological Project – which continues to provide a rich sequence of archaeological material. Recent excavations here continue to characterise the ‘maritime deserts’ of Northwestern Australia (Veth et al. 2014). These sites demonstrate hybrid maritime/desert societies (Veth et al. 2007) establishing their occupant’s ability to access both the ‘bounty’ of the littoral zone, with the less frequent or dependable resources of the arid uplands. One example of this from both Barrow and the Montebello islands is evidence of terminal Pleistocene *Terebralia spp.* consumption, increasing in frequency from around 12,000 BP (Manne and Veth 2014). This research challenges the suggestion that with changing sea levels the northwest coast would have been depauperate of resources (Beaton 1985). Rather, following Ward et al. (2013, 2015)
it is argued that during the Pleistocene-Holocene transition, Northwest macrotidal regimes would have increased the productivity of marine zones.

It is during this transgression period that large mangrove forests proliferated across the northwest (Woodroffe et al. 1985) as increased humidity and the tidal regime provided a suitable environment for mangrove growth (Jennings 1975; Semeniuk and Johnson 1982).

Excavation of inshore Rosemary Island in the Dampier Archipelago (McDonald and Berry 2017) has focussed on questions around adaptation during the Early Holocene. With the benefit of a rock art body containing many thousands of motifs across the Archipelago, these excavations are contextualised by visual representations of these adaptations. This engraved assemblage includes marine fauna, limited terrestrial fauna, animal and human tracks, anthropomorphs and various geometric motifs. Most of these engravings fall within Mulvaney’s (2010) art contrast states 3 and 4, which have been correlated with the mid-Holocene and Marine Transgression (McDonald and Berry 2017; Mulvaney 2010).

McDonald and Berry (2017) found evidence of increasing sedentism as a social response to change in population dynamics in the form of what are Australia’s earliest known domestic structures. These structures are ovoid stone features, like those recorded on High Clifffy Island (O’Connor 1987, 1994). Some of these stacked boulders include engraved boulders, in addition to basal grinding patches and midden material within and associated with these structures. Dates from excavations undertaken within one of these structures bracket occupation from 7665 ± 35 through to 6900 ± 335 cal. BP. It is argued these dates fit within a pattern of early-to-mid Holocene intensification – resulting in increased demarcation of space and a changing social organisation such as sedentism. Elsewhere on the island, dates from stratified midden sites show a pattern of an early mangrove economy (~10,950 – 9500 BP) transitioning to a rocky platform and intertidal economy (~7400 – .500 BP), mostly overlapping with use of the structures, and what McDonald and Berry (2017) argue are analogous with production of much of the art, based on an established stylistic chronology (Mulvaney 2010), and the most intensive period of use of the island.

The mid- to late Holocene saw a reduction in mangrove forests in the Northwest, and an economic switch from Terebralia sp. (mangrove) to Anadara granosa (sandy, rock platform and mudflat) in the archaeological record (Bowdler 1990; Kendrick and Morse 1990). A behavioural explanation for this is provided by Veitch (1999): that Anadara (r-selecting) is being actively procured based on faster and greater reproduction numbers, and is less prone to depletion than Terebralia (k-selecting). By choosing Anadara people have a more reliable resource, and are able to cope with increasing climatic variability and aridity. O’Connor (1996) has argued against
Veitch’s (1999) reasoning, arguing that *Anadara* mound building behaviour along the northwest coast is in line with climatic and habitat changes (Semeniuk 1996; in Clune and Harrison 2009:72).

Bradshaw’s (1995) excavations along the coastline from Maitland River to Balla Balla included Murujuga (the Dampier Archipelago). She documented the entire sequence of post-sea level rise occupation from $8520 \pm 80$ BP through to $1470 \pm 50$ BP, with the majority being very recent midden building activity. She, like most other researchers, found the shift to predominantly *Anadara granosa* from 4000 BP onwards. This pattern has been recorded across the northwest and from sites in the southern Kimberley (O'Connor 1996).

Lorblanchet’s work on Murujuga (1976, 1978, 1992; Lorblanchet and Jones 1979) in Gum Tree Valley and Skew Valley similarly demonstrated a shift from mangrove shellfish (*Terebralia* sp.) to sandy/rocky platform and mudflat shellfish (*Anadara granosa*). Lorblanchet recorded a change in lithic technology with this shellfish transition, with the lower levels recovering horsehoof cores and scrapers made from locally available granophyre, while the switch to *Anadara* also saw the introduction of microliths and raw material diversification to include chalcedony, jasper, slate and quartzite. These switches indicate changes in peoples’ mobility, from reduced trade and movement of raw materials, to an increased movement of people and materials.

Lorblanchet dated a fragment of *Syriox aranus*, found wedged amongst the engraved boulders at Gum Tree Valley, to $18,510 \pm 70$ BP. The preferred habitat of *Syriox* is sandy intertidal and sub-littoral (Abbott and Dance 1990). The $\sim 18$kya date returned coincides with the height of the LGM, when the sea would have been over 100 kilometres away, indicating transport, or its role as an heirloom (see McDonald 2015). Lorblanchet also recovered five engraved boulders during excavation (see Figure 4.21) providing the only reliable dates for engraved art across the Pilbara.

These dates relate to the deposition of the boulders rather than the engraving activity that produced them, and are thus minimum ages for these engravings. Boulder I has three profile anthropomorphic figures and was dated to $>3770 \pm 80$ BP; Boulder II has three human figures, and Boulder III has stick figures, and are both dated to greater than $2770 \pm 70$ BP; Boulder IV has a coiled snake/geometric dated to greater than $2600$ BP; and Boulder V is not illustrated in Figure 4.21 but is described as a groove, and dates to earlier than $3410 \pm 80$ BP. While these are minimum dates, and represent various styles, these boulders still predate the most recent climatic phase (Williams et al. 2015).
Lorblanchet’s *Terebralia/Anadara* transition is part of a regional pattern found along the Carnarvon and Pilbara coastlines (Bradshaw 1995; Clune and Harrison 2009; Veitch and Warren 1992; Veth and O’Brien 1986). The open area midden and shellfish scatters show that there is continuity of shellfish procurement through the Holocene and that the exploitation of shellfish occurred immediately following sea-level stabilisation, and establishment of these shellfish habitats (see Veth et al. 2014: 162).

Clune’s (2002) analysis of *Anadara granosa* mounds revealed basal dates from 4250 ±60 through to 670 ±55, which she argued represents the termination of mound formation in the region. Clune found an increased rate of site establishment, an increased complexity of exchange, and increasingly complex social and ceremonial organisation of regional economies (confirming aspects of Veth’s arid zone occupation model). She also argued that *Thalu* sites were a mid-to-late Holocene phenomenon (McDonald and Veth 2013a) and as ‘increase’ sites were a direct reflection of increasing aridity and climatic variability, reflecting increased pressures on survival (Clune 2002:327). While not observing the introduction of new tool types,
she saw an increased seasonal sedentism, resulting from wet season resource abundance, in contrast with resource scarcity (and increased mobility at other times of the year (ibid.: 322).

Within this context, a series of occupational models for the Northwest have been developed, each building on the former. These will be presented here, before discussing local Marapikurrinya archaeology, and a Marapikurrinya proposed rock art and occupation model.

**Occupation Models of the North West**

Three Pilbara occupation models are examined here, focussing particularly on the Holocene. These models cover occupation and settlement of the arid zone through changing environmental conditions, utilising archaeological site data and modelling timing of occupation in varying biogeographic zones (Veth 1989, 1993, 1995); time-series modelling and intensification from the Holocene using radiocarbon datasets and a GIS approach (Williams et al. 2012, 2013a, 2013b, 2015); and a coastal Pilbara example of modelling rock art proliferation and density through time and space across Murujuga (McDonald and Veth 2011; McDonald 2014).

1. **Settlement and Subsistence Models in Arid Zone Refuges (including the LGM hiatus)**

Veth’s seminal paper *Islands in the Interior* (1989a: and see Veth 1989b, 1993) introduced a model for colonisation and dynamic settlement patterns across arid-zone Australia, as an alternative to Gould’s ‘conservative desert culture’ (Gould et al. 1977). Veth combined observations of traditional Aboriginal land use and palaeoclimate records with archaeological occupation sequences from the arid zone and “biogeographical concepts of refuges, barriers and corridors” to cover different landforms at the core of the model (Veth 1989a:81).

Veth (1993) posited that in the past Aboriginal people structured their use of all available water sources and moved opportunistically in small bands towards areas of localized rainfall. During the period of increased aridity associated with the LGM the Pilbara would have fallen within the expanded arid zone core, resulting in ‘significant resource restructuring and stress’ (Veth 1995:745). In this model, the Pilbara uplands represented a refuge during the LGM when sand barrier deserts were at their least hospitable and likely not continuously inhabited, and where refugia are defined as areas providing reliable networks of permanent waters (Veth 1995: 734). This point-to-point process was later termed ‘cryptic refugia’ by Smith (2013).

Two decades ago there was a large gap within the dating record across arid northwestern Australia, from before the LGM until c. 12,200 ± 620 BP (Veth 1995), suggesting a broad
ranging occupation hiatus at the height of the LGM. This period matched up with evidence recovered by Morse (1993) at Mandu Mandu Creek on the Cape Range Peninsula. Morse recovered evidence for long distance ochre transport during the Pleistocene across the Pilbara, not seen in the archaeological record during the LGM, and visible again with climate amelioration: she argued that this pattern showed the breakdown of long distance trade networks at this time (Morse 1993; Veth 1995).

As more excavation was undertaken across the Pilbara, increasing data filled in parts of the LGM hiatus (e.g. Hughes and Quartermaine 1992), and the population mechanisms for coping with this stress were woven into the model. The focus moved to the changing, and now submerged, Pleistocene coastline as a ‘major fall-back area’, in line with Morse’s (1993) research on the Cape Range (Veth 1995: 734; Veth et al. 2014). Veth argued that post-LGM marginal landscapes became permanently colonised, aided by technological (e.g. grinding) and social structures, such as kinship systems which negotiated movement of people, and trade networks, to make changeable environmental situations adaptable. From this position, the model allows for fine-grained research to populate small scale movement of people through the Abydos Plain in the Holocene, targeting key resources (i.e. water, fauna and plants) both in the hinterland and along the newly forming coastal resources.

Brown’s (1987) model for Pilbara resource use (combined with Veth’s) has been developed and tested by decades of intensive mining-industry triggered heritage survey, and excavation across the Pilbara (e.g. Archae-Aus 2012; Gavin Jackson 2008 etc.). The mid-to-late Holocene intensification across the arid zone, with both climatic amelioration and social dynamism, are acknowledged as drivers of change and are key points of archaeological signatures in this model (see White et al. 2011):

- Increases in site usage i.e. artefact discard rates and sediment accumulation (Comtesse 2003; Smith 1986; Veth 1989a);
- Increased rate of site establishment (Clune 2002);
- Use of marginal environments (Hiscock 1994; Veth 1995);
- Introduction of new tool types such as backed microliths and tula adzes (Hiscock and Veth 1991; White et al. 2011);
- Specialized seed grinding and water procurement, storage and conservation techniques (Smith 1986; Veth 1987, 1989b);
- Increased complexity of exchange networks (Clune 2002; Gibbs and Veth 2002); and
- Increasingly complex social and ceremonial organisation (Gibbs and Veth 2002) and regional economies (Clune 2002).
Available data from across Marapikurrinya will be examined below within this heuristic framework.

2. **Holocene Intensification and Time Series Demographic Modelling**

Recent work by Williams and colleagues (2012, 2013a, 2013b, 2015) has utilised a dataset of 3761 published radiocarbon dates (from 1562 sites) from across Australia. Their approach has been to use time series techniques as a heuristic tool to look at changes in demography across the continent through time, identifying broad trends where radiocarbon is a proxy for human activity. Williams et al. build on Veth's refugia model, testing where radiocarbon dates match these areas. Williams et al. (2015) focussed on Holocene demographic changes, and it is during this period they argue for the development of complex societies and trade systems across much of Australia. Focussing in on the Holocene, Williams et al. (2015) divide this period into three phases:

1. Holocene Climatic Optimum: ~9000 - 6000 kya;
2. El Niño Southern Oscillation (‘ENSO’) aridity impacts: ~4500 – 2000 kya;
3. La Niña and intensification: ~2000 kya to the present.

The time series data and density and spread of radiocarbon dates is argued as demonstrating that there is delayed expansion and settlement of much of Australia until around 9000 kya coinciding with the start of the Holocene climatic optimum. During this first period, they argue for rapid population expansion with the growth and establishment of regional populations across approximately 75% of the continent. This includes most of the arid zone which they propose are populated out of Pleistocene refugia locations (Veth 1995), including the Pilbara hinterland. They link this rapid expansion to the spread of pan-continental archaeological and linguistic attributes, such as the Pama-Nyungan language family, the Panaramitee art style and backed artefacts. These three examples (language spread, art production and technological innovation) will be discussed below to test their utility in this model, and the veracity of the model within this period of key interest.

Following climatic amelioration, the second period of ENSO climate systems and associated unpredictable resource availability are argued to have led to population fragmentation, lower levels of food production (e.g. seed-grinding) and the periodic abandonment of ecologically marginal sites.

In the last 2000 years, La Niña conditions are linked to the intensification of mobility strategies, such as stockpiling and storage of foods, with broadening of the diet and demographic packing. The radiocarbon records show revisitation of marginal desert sites, and technological
innovations that resulted in the social and religious practices recorded at European contact from the 19th century onwards.

As discussed in Chapter 3, the spread of the Pama-Nyungan language family across much of Australia, excluding the tropical central north and north-west, and Tasmania, has been 'dated' to approximately 6000 BP (McConvell 1996). McConvell's model, however, relies on the inclusion of archaeological data to verify assumed rates of linguistic change within Aboriginal languages (Veth 2000).

Late Pleistocene-aged art production classed as Panaramitee (Maynard 1979) from sites such as Early Man Shelter (13,200 ± 170 BP) (Rosenfeld et al. 1981) and Sturt's Meadows (~10,000 BP) (Clegg 1987), and recent dates for a stratified charcoal motif from Nawarla Garbanmang (26,913 – 28,348 cal. BP) (David et al. 2013) challenge William et al.'s (2015) timing of the Panaramitee to the Holocene. There is increasing evidence for regionalisation of rock art styles during the terminal Pleistocene (Balme et al. 2009; McDonald and Veth 2009; Veth et al. 2011; Veth et al. 2017) rather than the late onset of art production across the continent and subsequent regionalisation during the Holocene.

Williams et al. (2015) also connect the development of backed artefact technologies to the mid-Holocene, however, there are examples from around Australia which challenge this. Slack et al. (2004) has identified backed artefacts within terminal Pleistocene deposits from Gregory River in northwestern Queensland. These excavations support arguments made by Hiscock at Mussel Shelter, that it is during the mid-Holocene that backed artefact production proliferates, rather than marking the point of earliest production. Usenware and residues of the Mussel Shelter backed artefacts found that the backed artefacts did not have a single, task-specific function or actions associated with them, challenging the argument for backed artefacts serving necessarily as barbs in spears for hunting, or as ‘weapons of war’ (Attenbrow et al. 2009: 2768). This was seen as providing a more nuanced explanation for groups' responses to ENSO conditions during the mid-Holocene. Backed artefacts proliferated at a time of environmental variability and stress as a multi-purpose and versatile tool that was flexible and useful for several tasks that effectively helped reduce 'risk'.

However, the demographic model of Williams et al. (2015) provides predictions for population increase and density, which is used as a baseline for the assumed onset of Marapikurrinya engraving production during the mid-Holocene after sea level stabilisation.

In the early Holocene, there would have been rapid population expansion and establishment of the Pilbara regional populations. By 5-4000 years ago, there would have been increased
mobility of groups in response to ENSO intensification, while in the last 2000 years there was an intensification in occupation and art production with the onset of La Niña conditions (Williams et al. 2015:11-12).

Changes of population density through time as indicated by Williams (et al. 2013a) will be utilised as a framework for examining stylistic choice and/or change within the Marapikurrinya rock art repertoire. Whilst population density measurements through time do not feed directly into the cultural choices that are likely to have been made by people producing rock art, rock art as a proxy for cultural signalling can be tested against this environmentally-based model. Such a method has been used in the development of a predictive for a different Pilbara coastal rock art province (McDonald 2015).

3. PILBARA COAST ROCK ART MODELLING

McDonald (2015) has developed a predictive model for rock art production across Murujuga (Dampier Archipelago), building on research undertaken for the National Heritage Listing of the Dampier Archipelago (McDonald and Veth 2009) and research across the Pilbara and Western desert arid zones systems more broadly (McDonald and Veth 2006; 2013a).

Murujuga is one of the richest engraving assemblages worldwide (e.g. Mulvaney 2010; Vinnicombe 2002), and is located along the current Pilbara coastline approximately 250 kilometres southwest of Marapikurrinya. This engraving province has a significantly different geology and geomorphology to Marapikurrinya: a very old (Neoarchaean, 2.7 billion years) gabbro and granophyre landform with a significantly slower weathering rate (Donaldson 2011; Pillans and Fifield 2013). The Dampier gabbro and granophyre ranges and valley systems have significant elevation, making this a prominent and enduring feature along the coastal Abydos Plain both today, and presumably so in the past.

McDonald's (2015) predictive models for rock art production through the Pleistocene-Holocene transition argues for how people are choosing to mark their landscapes in a place through a long repertoire of human activity, being populated before and used as a refuge during the LGM. The Dampier Archipelago is a mid-Holocene landform, resulting from rising sea levels and the inundation and islandisation, in much the same way that the Marapikurrinya calcarenite ridges provide high points above the mangrove and mudflats.

McDonald (2015) allows for an understanding of how early arid hunter-gatherers are interacting with their landscape through the transition from a broad coastal plain and riverine hinterland environment, to arid coastal hunter-fisher-foragers. This is achieved by tying together regional archaeological data, climatic data, sea levels, and deploying Mulvaney's
(2010) rock art stylistic sequence. The model also attempts to understand the extreme stylistic variability found within the Murujuga rock art province – by predicting that people used the outer islands less during the Holocene, and focussed more on the more proximal Murujuga landscapes.

The two final phases of the Murujuga sequence are of particular interest for this research, these correlating with the period of assumed engraving activity at Marapikurrinya:

- the Marine A (Mid-late Holocene, ~6000 – 4500 BP) where the sea level has reached its maximum level. This heralds the development of a distinctive Murujuga style: of outline and internal design marine and terrestrial fauna, anthropomorphs show group behaviours and distinctive headdresses and material culture; and

- the Marine B (Late Holocene, from 4000 BP onwards) where there is an economic switch to sand flat and rocky resources, evidence of increased intensity of site occupation and accelerated ritual and ceremonial activity. The marine-dominated fauna in the art shows increasing schematisation; human figures have exaggerated anatomical features and different ceremonial paraphernalia to preceding phases.

In summary, the model proposes that rock art is connected to resource foci through time, (particularly water) and that this activity was concentrated on the Burrup and proximal islands from the mid-late Holocene, i.e. the most persistently accessible landform(s) through time. McDonald (pers. comm. 2016) also considered that the Pilbara occupation model suggests that there should be pulses of activity – and further stylistic changes evident within the last 4000 years, as is indicated in more detailed modelling from the Western Desert (McDonald and Veth 2013a).

All three models can be used to predict - and then test - human behaviour throughout the Pilbara during the Holocene. For example, Veth’s refugia model (and see Hiscock 1990; Smith 1989, 2013) points to changes in landscape use and selection of landforms and resources at the height of the LGM, and the consequent resettlement of all landforms after this. Parts of the Pilbara, such as the Hamersley Plateau and Dampier Ranges would have provided refuge areas during the LGM, when Marapikurrinya would have been relatively arid, with low elevation ridgelines, and reduced resource availability and reliability. With climatic amelioration, population densities began to increase with the rising sea, and as a variety of landforms were re-inhabited (Williams et al. 2015). This pattern continues and intensifies into the last 2000 years. Fitting within these population changes are predicted social responses to change in environment and resources, territorial organisation and marking of social identity through rock art.
Marapikurrinya archaeology is now presented, in light of these models, followed by a localised model for Marapikurrinya rock art.

**MARAPIKURRINYA ARCHAEOLOGY**

Much of the local archaeological investigation in and around Marapikurrinya has been instigated by industrial development: the expansion of the town and its associated infrastructure. The Marapikurrinya landscape includes an extensive suite of human activity around two key features – engravings and shell middens (Warren 2001). The Holocene record is also reflected by stone arrangements, a variety of grinding patches and axe-grinding grooves, a low density stone artefact repertoire, and occasional human burials. The most recent past is also documented by historic campsites (McCarthy 1962; Warren 1995, 2001).

The low elevation ridgelines are affected by a large (~7 metres) diurnal tidal range and annual cyclones, which has had severe impacts on both surface archaeology and the development of subsurface deposits. Consequently, most detailed archaeological information for this local area comes from survey work, and recording of surface archaeology (e.g. Warren 1994, 1995, 2001), with limited excavation of shell or midden deposit (e.g. Sullivan et al. 2011; Eureka 2007) and one excavation undertaken from shell accumulation within the vughs (or ‘solution holes’) of a calcarenite ridges (Warren and Hook unpublished).

The South West Creek 1-7 sites, with their co-occurrence of midden and engraving along the limestone ridges, demonstrate a combination of mangrove and mudflat environments (Warren 1994:202). Warren argued for an understanding of places where people engaged in several different but interrelated activities, including engraving production, shellfish predation material and the production of stone arrangements (*Thalu*, as noted by McCarthy 1962). Warren also observed a correlation between engravings and native figs (*Ficus platypoda*) and rock art, which he argued indicated a preference for fresh water sources.

Excavation at South West Creek 7 - a 'large and discontinuous' engraving site covering a maximum area of 800 by 100 m - recovered a basal date of 3270 ± 70 BP from an *Anadara granosa* dominated shell midden associated with engravings (Warren 1995). The largest section of this midden was mounded (1995:13).

While the mangrove and creek systems which fringe the calcarenite ridges are where much of the occupation and other evidence of human behaviour is found (Warren 2001), there is little evidence of exploitation of mangrove resources (e.g. *Terebralia spp.*) at most Marapikurrinya sites (Clune 2002; Green et al. 2006; Warren 2001). The middens here are predominantly *Anadara granosa*. Two such sites located at the northern end of Anderson Point (FMG P04-001...
and FMG P04-002) also contained scattered *Terebralia* and pearl shell, and were both stratified and at some depth. Green et al. (2006) argued that this pattern at midden sites resulted from a prograding coastline and progressive silting up of the mangrove lined tidal creeks, with older (*Terebralia*) middens being buried in the process. This was not supported in the subsequent excavations which demonstrated midden use was continual through the mid to late Holocene (Eureka 2007).

Clune and Harrison (2009) and Harrison (2009) proposed that the Marapikurrinya *Anadara* mounds represented aggregations of large groups of people and represented shell-collecting behaviour associated with ceremonial activity (Meehan 1982).

However, the cultural origins of these shell deposits continue to be debated. Recent excavations (Sullivan et al. 2011) using a geoarchaeological approach tested the distinction between Aboriginal shell middens and natural shell deposits. This study is located in proximity to the engraving sites analysed for this research (and close to the excavations undertaken by the Eureka and Anthopos (2007) teams and interpreted by Harrison (2009), and points to episodic cyclones and storm waves having the potential to redeposit shell similar in appearance to the midden deposits. Consequently, caution needs to be applied to interpreting the Marapikurrinya shell middens.

The Marapikurrinya archaeological record fits into the broader Pilbara coastal pattern of occupation, with people exploiting marine resources, particularly *Anadara*, around the mangrove lined tidal creeks from mid Holocene. Marapikurrinya may record a slightly earlier transition to *Anadara granosa* exploitation than elsewhere along the Pilbara coast (Clune 2009), which may result from localised changes to the Marapikurrinya coastline (see Ward et al. 2015).

**COMBINED NORTHWEST ARCHAEOLOGY AND EXISTING OCCUPATION MODELS**

Occupational records and patterns of human movement show that the Pilbara has been inhabited throughout the last 50,000 years. Changing patterns of Holocene site use can be seen in response to climatic change, particularly the effects on sea level and coastal productivity, and episodic aridity creating resource shifts. After 7000 BP as sea level stabilises along the Pilbara coastline, Marapikurrinya emerged as a coastal embayment, and this rich coastal hub became a focal point in the landscape. Sea-level fluctuations, high tidal ranges and cyclonic conditions affect the local archaeological record, but regional changes in population density (Williams et al. 2015), and local seasonal resource abundance are linked to the creation of rock art here, as a social response to changing territorial organisation.
Our understanding of Holocene use of the region comes from the interior arid rockshelters and open shellfish middens along the coastal strip. Seasonal movement of people during the Holocene across the Pilbara, targeting fluctuating resources (Veth et al. 2014) fits within broader aggregation models (Conkey 1978, 1980; McDonald and Veth 2012), and when recognising Marapikurrinya as a maritime desert (Veth et al. 2014): a hinge point between seasonal abundant coastal resources, and the variable arid hinterland that stretches behind it.

It is suggested that people moved optimally throughout the Pilbara hinterland throughout the year, targeting the coast generally, and Marapikurrinya specifically, following resource bounty available following the wet season. This seasonal understanding would rely on movement and exchange between family groups within the Kariyarra language bloc (as identified in Chapter 3).

Marapikurrinya’s occupation dates recovered from shell midden material cover from approximately 5500 BP up until the recent past, fitting within the post-sea level stabilisation period from 7000 BP onwards. Both the engraved repertoire itself and the archaeology of Marapikurrinya indicate that the available information relates predominantly to the mid- to late-Holocene. To understand how the rich body of rock art focussed around the Marapikurrinya harbour fits within this context, a predictive model for Marapikurrinya rock art is proposed here.

**MARAPIKURRINYA OCCUPATION MODEL AND ROCK ART CORRELATES**

Issues that need to be integrated into a predictive model for Marapikurrinya include Pilbara regional processes, such as changing sea levels, reduction in territory, changing economies and the creation of new coastal habitats. Following sea-level stabilisation in the Northwest, the archaeological record provides a strong case for mid-Holocene intensification (Clune 2002; Veth 1993, 1995; Williams et al. 2015) and coastal coalescence (Morse et al. 2014; Veth et al. 2014). It is unlikely that Marapikurrinya groups remained purely reliant on marine resources but that hybrid economies would have been developed, and seasonal movement would have taken advantage of littoral bounties when available, and targeted scarcer hinterland resources also when available, for example directly following the wet season:

“...land-use patterns of groups occupying the...western Abydos coast during the mid to late Holocene were underpinned by a complex social organisation involving diametrically opposed inclusion and exclusion strategies. Territorial boundaries were strictly observed for parts of the year, but ecological constraints are likely to have made mobility, ephemeral site use and interaction between groups necessary for survival in a
resource-stressed environment, as suggested by the ethnographic, ethnohistorical and linguistic sources”. (Clune and Harrison 2009:76)

Subsequently, this research seeks to identify whether an embedded hybrid economy is visible within the rock art.

The predictive model proposed for Marapikurrinya is:

1. With sea level stabilisation in the region from 9-6000 years ago, associated rapid population expansion, increased sedentism, and the spread of Pama-Nyungan languages, the Marapikurrinya rock art assemblage evidences a heterogeneous localised style, marking territory (exclusion);

2. With increasing aridity and climatic instability from 4500-2000 years ago there is a change in rock art production reflecting increased mobility and regional interaction, including aggregation of people at Marapikurrinya; and

3. With climatic amelioration and population increase in the last 2000 years, Marapikurrinya rock art reflects interaction between neighbouring groups, and/or aggregation reflecting seasonal abundance of seasonal use of this place, as reflected in stylistically heterogeneous art?

This model will be tested through diachronic and synchronic stylistic analysis of the Marapikurrinya rock art assemblage.

SUMMARY

The rich rock art repertoires of South West Creek 4 and Mourambine Kariyarra 3, which include engravings, stone artefacts, grinding patches and stone arrangements, provide the assemblages used for this investigation. Clune and Harrison’s (2009) arguments for seasonal variation between heightened territoriality and mobility and exchange between groups will be explored within this rock art body – looking for open and closed social marking through style.

The Marapikurrinya rock art assemblage will be used to explore how style has been used to negotiate group identity. Stylistic variability within this rock art body will be explored to examine McCarthy’s chronology of styles. To fully understand how this rock art province reflects and asserts group identity (both inclusively and exclusively), a more comprehensive analysis of the assemblage’s track and geometric components needs to be made. The (less numerous) figurative components of the Marapikurrinya assemblage need to be better contextualised within the entire corpus. Stylistic analyses, combined with superimposition analysis and the analysis of scenes/compositions, will test whether diachronic change can be
discerned in the Marapikurrinya style(s), and what this tells us about changing group identity, as shown through the rock art. The dichotomy between graphic vocabularies - i.e. figurative, track and geometrics - needs to be explored.

In summary, the Marapikurrinya engraved repertoire will be analysed to explore whether this is:

- A distinct rock art style that reflects a local group negotiating territorial boundedness and social strategies to exclude other groups; or,
- a rock art style which reflects hyper-mobility of people and inclusive social connections across the Pilbara.

The methodology implemented to address these questions is presented in Chapter 5.
CHAPTER 5: METHODOLOGY

The Marapikurrinya region was selected for this research based on the richness and distinctiveness of the rock art assemblage (e.g. McCarthy 1968; Petri & Schulz 1951; Warren 1995, 2001). Additional factors which increased the suitability of this body of rock art included:

- Potential connection to recorded mythological narrative and mythological places (Palmer 1977);
  - Ethnohistoric identification of named ancestral beings within the rock art assemblage (McCarthy 1962);
- Density of engravings including high frequency of superimpositions for an engraved repertoire; and
- Richness of associated archaeological material i.e. stone arrangements, grinding patches, and middens (Warren 1995), providing comprehensive and complex archaeological assemblages which might address the research questions.

Sites were selected for analysis partly because there have been major impacts to other large rock art sites around Port Hedland (see Chapters 1 and 4). The creation of the Port Hedland township and associated infrastructure over site Two Mile Ridge (see Figure 5.1), particularly mining related rail, laydown areas and port infrastructure, has led to significant loss of archaeological evidence. While Two Mile Ridge was recorded in detail by McCarthy, his records as presented in a Western Australian Museum (WAM) Report (1962) are motif focussed, and do not record the site complex in its entirety, or in a way that allows for identification and/or replication of the site. In addition to this, his original tracings and photographs appear to be currently missing, following discussions with the Australian Museum and the Australian Institute of Aboriginal and Torres Strait Islander Studies (AIATSIS).

This research focusses on two largely undisturbed sites - South West Creek 4 ('SWC4') and Mourambine Kariyarra 3 ('MK3') - with identical geology and presumed comparable density of engravings to the Two Mile Ridge site complex. These sites present both a rich source of information in themselves, and allow for comparison with McCarthy’s (1962) recordings. However, across these sites rock art density varies, and the methodology implemented, as outlined below, targeted sampling of both small and large concentrations of engravings.

Prior to this research neither SWC4 nor MK3 had been the subject of detailed study. These places provide the opportunity to explore the nature of landscape marking through rock art, and associated group identity assertion in Marapikurrinya. Detailed study of this coastal Pilbara region has the potential to provide strong evidence for the uniqueness of social groups across
‘the Pilbara’, and allows for an exploration of connection to other places within the west of Australia.

This chapter provides the methodology employed within this framework to meet the stated research goals. Fieldwork is summarised, including data collection techniques, development of a Marapikurrinya rock art taxonomy and the variables recorded within this, particularly motif class, type, and form. The analytical methods applied to this data are then summarised.

FIELDWORK

Fieldwork was undertaken in two phases. Initial site survey was undertaken in 2013 as part of the Port Hedland Conservation Plan survey (Zubieta and McDonald 2015). Detailed site recording of selected sites, specifically for this research, was undertaken in 2014.

2013

During 2013, I accompanied CRAR+M researcher’s Dr Leslie Zubieta and Professor Jo McDonald from the University of Western Australia to document the extent and variability of rock art across the Marapikurrinya region. The purpose of this survey was to develop a Cultural Management Plan (CMP) of these rock art sites for the Kariyarra community, on behalf of BHP Billiton Iron Ore (‘BHPBIO’: Zubieta and McDonald 2015). Some funding for my fieldwork was seeded by the CMP funding; and permission to use this data was sought and granted by BHPBIO. Three CMP fieldwork trips were completed (25-26 July, 4-8 September and 11-13 October). The following sites were visited and surveyed on foot with photographs taken of both distinct and representative engravings. A selection of sites* were recorded in detail during these field visits (Figure 5.1):

- SWC1-7*
- PORP21012
- 2 Mile Ridge
- Wilson St B/2 Mile Q
- Anderson St
- East Creek
- Insert B/EA01
- Nelson Point Fuel Facility 07-01
- Wilson St C
- 4 Mile Creek
- 23232
Figure 5.1 Named engraving sites (yellow) in the Marapikurrinya region (Source: NearMap)
Due to development impacts, the original ‘2 Mile’ registered Department of Aboriginal Affairs ('DAA’) site (see Chapter 4), recorded in detail by McCarthy (1962), is now known as the Two Mile Ridge Complex. The complex is divided into a series of smaller sites including East Creek, Wilson Street B, Anderson St, Nelson Point Fuel Facility, Areas A to O, and PORP21012.

A section of the ridge is a Protected Area (PA02: the second PA declared in the State under section 19 of the WA Aboriginal Heritage Act 1972-80). Part of this PA and section of the ridge was rehabilitated between 1989-1990 (Atkins 1990), with a wooden viewing platform built adjacent to the Two Mile well, and signage erected. The fencing, walkway and signage are currently in disrepair with recommendations made to rectify this situation (Zubieta and McDonald 2015).

Burgess Point (which is on the BHPBIO mining lease) was not visited as part of this program, however photos of a selection of engravings were provided by BHPBIO.

From these field visits, a database was compiled to summarise the size, density and variability of rock art assemblages within the sites across the Marapikurrinya region. This fieldwork was done for audit purposes and provided the background information necessary to identify where detailed fieldwork focus should be for this research.

2014

Sites SWC4 and MK3 (Figure 5.1) were selected as key sites to answer the research questions posed by this thesis. Key factors were density of engravings, density of superimpositions, presence of contextual archaeological material, low level impacts to – and integrity of these places – and identified mythologies with South West Creek 4 (registered DAA Mythological Site, and Aboriginal Heritage Act 1972 ['AHA'] section 19 Protected Area 25). These mythologies are not publicly accessible, nor associated with their DAA site file. However, they were recorded by Kingsley Palmer who elsewhere provides information on the Minyiburu (Seven Sisters) songline and its connection to Marapikurrinya (1977, 1981).

ETHICS AND COMMUNITY CONSULTATION

An integral part of this research involved consultation with the Kariyarra people on whose land these sites fall. Diana and Kerry Robinson were identified as the key Aboriginal stakeholders for this area, as representatives of the Kariyarra People, the Registered Native Title Claimants for
the Marapikurrinya region (WC99/3). The Port Hedland harbour, mangroves, and surrounding marsh land form the clan estate known as *Marapikurrinya Yintha*, Diana and Kerry Robinson’s father’s father’s country (Gavin Jackson 2008:27).

To initiate engagement with the Kariyarra, preliminary meetings were held as part of the UWA CMP process. Following meetings with the Robinsons in 2013, initial letters were sent to outline my proposed research, and to gain their permission to undertake this research in a culturally appropriate way. During site visits in 2013 I was able to meet and discuss my proposed research in person with Diana and Kerry. Each of the sites proposed for my research was also visited, accompanied by either Kerry or Diana, and with other Kariyarra people. Additional letters were sent to Diana and Kerry to outline my developed research proposal for their approval. Consent to undertake this research from Kerry Robinson, on behalf of the *Marapikurrinya*, was received in February 2014 (Appendix 2). I have continued consultation and engagement with the Kariyarra throughout the course of this project.

Following this process, formal ethics approval was sought and granted by the UWA Human Research Ethics Office on the 17th of March 2014. Ethics approval for this project (#RA/4/1/6418) is assessed by the Human Research Ethics Office (‘HREO’) annually, and was approved on 9th March 2015, 22nd March 2016, and 28th March 2017 (Appendix 2).

During fieldwork in 2014, Kerry and Diana were contacted, and discussions were held at their houses in Port Hedland township (opposite 2 Mile Ridge) prior to fieldwork with Kerry Robinson. Senior Kariyarra men Thomas Monaghan and Stephen Brown assisted with fieldwork through short visits to sites, both coastal and inland. Discussions were held at sites for cultural interpretations of places visited, with conversations about the creators of engravings, and contact history of the Marapikurrinya region.

Kerry and Diana Robinson were provided with a summary update on the results of this thesis, during discussion in Port Hedland during April 2017. Following submission, Kerry and Diana will be supplied with copies of this thesis, and associated data.

**DATA COLLECTION AND RECORDING TECHNIQUES**

**Coastal/Tidal Islands: South West Creek 4 and Mourambine Kariyarra 3**

The two sites selected for detailed recording (South West Creek 4 and Mourambine Kariyarra 3) are tidal islands on the western side of the Marapikurrinya harbour. Two weeks were spent on each island undertaking intensive detailed rock art recording during July and August of 2014. The same recording strategy was deployed on each island, with initial site survey to establish
the extent of rock art panels, and locate areas of greatest density. Following this, a sampling strategy was undertaken, to target areas of high density (to allow for the recording of complex superimpositions found in these areas), as well as panels of medium and low density, and isolated engravings. The purpose of this sampling strategy was to be able to provide comparative samples for different densities of engraving, against other archaeological and environmental factors (e.g. presence of wells/water sources), to analyse discrete site uses.

Recording was undertaken by a two-person team, with two sets of recording sheets (see Appendix 3) and necessary equipment (compass with altimeter, measuring tape, pencils for drawing and recording sheets). Each individual recorded all visible motifs within selected areas, completing a recording sheet per motif, or complex scene where motifs were connected. A GPS point was taken for each motif or complex panel using a handheld Garmin GPS (3-5 metre accuracy). Photographs were taken on a single camera, a Canon 6D using a multifocal 24-105mm lens, with the GPS function turned on to georeference each photo. Photographs were taken of each motif or complex panel, with landscape context shots taken where relevant.

Figure 5.2 Monopod setup utilising CamRanger and iPad in two-person team (Sam Harper and Emma Beckett; Photo: Jo McDonald)
Where extensive complex panels were encountered, a monopod was used to photograph the entire panel to maintain high level contextual integrity of how the motifs and rock surfaces were integrated (Figure 5.2). A 50mm prime lens was used for this photography, and the camera attached to a monopod which created a distance of approximately 2.1m between the lens and ground surface. Photography of these large panels was aided through use of a CamRanger, which linked the camera view to an iPad mini. One person operated the iPad mini, from which the photographs were taken using the CamRanger software, allowing greater control of the images taken. The second person, holding the monopod and camera stable with the use of a neck harness (see Figure 5.2), walked in parallel transects across the panel, aiming for approximately 50% overlap between images. The purpose of this technique was to provide a series of photos with enough overlap to be processed using photogrammetry software (Agisoft Photoscan).

Data was collated each evening, with digital photographs copied to external hard-drives, and photographic scans of all paper forms converted to PDFs, using the iPad application Scanner Pro.

**INLAND**

In contextualising the coastal rock art of Marapikurrinya within the Kariyarra cultural and linguistic bloc, a review of known engraving sites was undertaken from the surrounding hinterland. A site search was undertaken using the Western Australian Department of Aboriginal Affairs (‘DAA’) Aboriginal Heritage Information Search (‘AHIS’), in combination with recorded sites identified in published material (e.g. McCarthy 1962; Worms 1954: see Chapter 4). Physical site records were then accessed at the DAA, and available images scanned for inclusion in this analysis. This process was undertaken to clarify the stylistic nature of Marapikurrinya rock art, in the context of the larger Kariyarra bloc, and the regional Pilbara. This site card information was combined with published photos and drawings to produce a basic record of rock art styles found within these borders. The result of this desktop study was provided in Chapter 4, and provides background to the results of the above fieldwork.

**DATA**

All 8320 recorded motifs were entered into an excel spreadsheet, cross-referenced with ~25,000 digital photos. Each motif was coded by date and recorder sequentially, i.e. 26S-001: the first motif (-001) recorded on the 26th (26) by Sam (S). Basic information was included in this spreadsheet: including counts and ratios of motif types, size, location, technique, form, superimposition, condition, attribution within the McCarthy (1962) sequence, and interaction
with the natural vughs in the rock surface. Additional detailed desktop recordings of particular attributes were made for motif groups pertinent to the thesis’ research questions (i.e. anthropomorphs, patterned material culture, marine fauna and tracks).

**TAXONOMY AND ATTRIBUTES**

For this research, broad categories have been used to provide analytical tools for sorting motif groups. However, this research also seeks to explore within motif types allowable stylistic variation (see Munn 1973). For example, what makes a 'Minyiburu' figure, how homogeneous is this motif group, does it correlate with meaning encoded by the engravers, and does it have scientific benefits to archaeology? By grouping motifs into types, and in certain circumstances labelling these groups, an etic classification scheme was used, and the issues this raises will be discussed further here.

Taxonomies allow for the comparison of motif types within a classification system, however the development of a taxonomy comes with theoretical issues ‘nearly as old as prehistoric archaeology itself’ (Adams 1988: 41).

To organise rock art into a system, researchers use the terms ‘classification’, ‘typology’ and ‘taxonomy’, and within these systems talk about ‘types’, ‘variables’ and ‘attributes’. These terms are often used interchangeably, and at other times are distinctly defined to meet specific research and theoretical questions. While a ‘classification’ is a general term for ordering a system, Adams defines a typology as a particular type of classification where things are ordered into mutually exclusive groups, and a taxonomy is a classification or typology with a hierarchical structure (1988:43-44).

Types allow for things to be grouped together, whilst allowing for variation between members of the group (McMah 1965), while also reflecting common design characteristics basic to their nature (Officer 1984). Type as a concept, expressed intuitively or formally, has to do with the inter-relationship of variables, shows the inter-relationship of variables (attributes), and has the potential to express identity and meaning. It is the combination of attributes in a consistent pattern that have been argued to represent active choices in preference, rather than representing a purely arbitrary procedure (contra Adams) of the researcher in applying etic types (Spaulding 1953:305). In recognising these patterns, it can be argued that while the typology itself may be etic, it has the potential to reveal emic information around choices of the artist.

More commonly, however, researchers are building upon extant typologies, using the ‘scholarly’ approach (Franklin 2004), which leads to the spread of common ‘types’, and resulting focus on
variables. As types become part of the public domain, they can be modified, and acquire meanings which they were not initially intended to include (Adams 1988:54).

Variables distinguish classes within types, and attributes within variables. Variables are essentially qualitative in that they provide meanings important to the class of objects being looked at, where attributes are quantitative, looking at identity, and how they can be established from each other. Variables can be intrinsic – and determined by direct examination; contextual – from where the object was found; or inferential – inferences made by the researcher based on morphological or location contexts, like function or emic significance (Adams 1988:48-49).

In the Australian context, the motifs types, attributes and variables in use have been largely developed through a hierarchical system, with early researchers such as Maynard (1979) and McCarthy (1968) attempting to develop pan-Australian sequences by establishing the groundwork for Australian rock art research (as discussed in Chapters 2 and 4).

**Variables Recorded**

As outlined in Chapter Two, the Marapikurrinya assemblages are being used as a case study to examine identity marking in rock art. The figurative components of the Marapikurrinya style have received much greater attention than the geometric and track repertoire (Chapter 4), yet it is argued here that the two stylistic repertoires need to be read together as two parts, or vocabularies, of a larger information system, to be understood contextually through space and time. Both vocabularies are defined with shared attributes within a taxonomy.

The taxonomy for this project was developed to classify the Marapikurrinya rock art systematically and scientifically. Individual rock art motifs were organised into a hierarchical structure, using common and broad categories of motif class (i.e. Geometric, Anthropomorphic, Zoomorphic, Tracks, Phytomorphic, Material Culture and Amorphous: e.g. McDonald and Veth 2006; Mulvaney 2010). Within this structure, these groups were divided into motif types (e.g. circle, line, fringe). Set variables were recorded across all motifs (e.g. form, technique, size). Additional variables recorded within specific type groups were examined in closer detail to answer specific research questions. For example, all shields were subject to recording of additional variables, including their intrinsic design variability. Variables which may infer additional meaning included using ethnographic emic classes and names, such as ‘Murra Murra’ or ‘Minyiburu’ for anthropomorphic types, identified as such by Kariyarra informants in the 1950’s (McCarthy 1962).
**TECHNIQUE**

The following techniques were recorded during the classification of the assemblage. These techniques can occur singularly or in combination:

- **Abraded**: manual abrading or rubbing;
- **Pecked**: percussion with a sharp hammer;
- **Pounded**: percussion with a flat hammer;
- **Incised**: scoring with a sharp hammer/other tool; and
- **Manual**: grinding (e.g. axes, spears, wet milling of seeds).

These definitions follow those provided by Wright (1968) and McCarthy (1962), and provide basic mechanical descriptions that separate out the production of these engravings.

The majority of engravings are either pecked, or pecked and abraded. Variations in the size of visible peck marks were observed, but not systematically recorded. Further research in this area could provide interesting information around engraving tools, and cultural choices made in motif production.

**Motif List**

Motifs were classified broadly into motif classes, and then into motif subjects within each class. Variations on subjects were recorded, particularly amongst geometric motifs. The following list provides a summary of motif classes used:

- **Amorphous**: indeterminate, general areas of pecking;
- **Anthropomorphic**: human-like;
- **Geometric**: composed of shapes and lines;
- **Material culture**: identifiable objects;
- **Therianthropic**: human and plant-like;
- **Tracks**: animal tracks and marks e.g. feet, tail, paws; human tracks e.g. hands, feet;
- **Therianthropic**: human and animal-like; and
- **Zoomorphic**: animal like.

The following figures (Figures 5.3-5.10) illustrate the motif classification scheme used, and motif types present. Additional definitions are provided in Appendix 4.
Figure 5.10 Geometric classification
**FORM**

The following form categories were used, individually or in combination:

- Infill;
  - Intaglio;
- Linear;
- Manual (e.g. grinding patches);
- Outline; and
- Patterned.

Intaglio forms fall within the infill category. The difference is that an intaglio figure is regularly and fully pecked out to create flat negative space, whereas an infill figure is irregular, but still consistently pecked out (Figure 5.11-5.13).

**Figure 5.11** Profile-view comparison of intaglio (left) and infill (right) form

**Figure 5.12 and Figure 5.13** Examples of intaglio (left) and infill (right) forms
SYSTEMATIC RECORDING OF SUPERIMPOSITION

It has long been recognised that it is difficult to correctly identify the order of superimposed engravings, particularly without the use of magnifying or other in situ technology (e.g. Clegg 1987; Franklin 1988; Maynard 1979). This may be complicated by conflating Sydney sandstones with Marapikurrinya calcarenite limestones, as many of the commenters are basing their comments on experience of the former (e.g. Clegg 1987: 20). For example, Clegg states that (1987:21):

The study of superimposition of unpatinated engravings is less promising that the study of drawing superimpositions, for a little experimentation reveals that all combinations of engraved grooves or pits can be reproduced by making either groove first.

Maynard (1979) and Franklin (1988) also argue that intersecting facets of engravings are obliterated with time as a result of erosion and patination, particularly in the case of solid figures over linear figures.

During fieldwork across Marapikurrinya sites differential weathering of engravings was observed between sites, particularly comparing Two Mile Ridge to both SWC4 and MK3. While Two Mile Ridge has been subject to ongoing impacts (e.g. increased weathering of engravings by iron ore dust and proximity to the transport corridor/active port (Atkins 1990), these impacts have not affected sites SWC4 and MK3. Consequently, and for the benefit of superimposition analysis, differential weathering rates are often evident between different engravings, and individual peck marks are frequently identifiable.

For an engraved repertoire, superimpositions are relatively frequent at Marapikurrinya with approximately one quarter of motifs (N=2062, 24.76%) observed to be in a superimposition relationship. Globally, this frequency is extremely high for an engraving repertoire. Particular motif classes have higher frequencies of superimposition (Therianthropes, Anthropomorphs, Zoomorphs and Material Culture), with a potential divide between figurative motifs (on average 43.28% are in superimpositions) and geometric and track motifs (on average 21.68% are in superimpositions).

These factors present the study of superimposition at these places as potentially significant and productive. This theme will be explored further in Chapter Seven.
Figure 5.14 Superimposition relationship where peck marks in the outline arm clearly superimpose preceding turtle engraving, with enlarged view (bottom), most recent arm (blue arrow).
Examination of these superimpositions, particularly on panels of high repeated engraving activity, provide the opportunity to test McCarthy’s (1962) sequence, as well as the validity of inferring a sequence from engravings via visual inspection. It was found that in some situations, and particularly with highly weathered engravings, that the order of engravings could not be determined. However, in the majority of superimpositions, sequencing was possible through examination of visible peck marks (Figure 5.14), oblation of underlying engravings, and to some extent evidenced by differential weathering rates between motifs. Whilst weathering rates of engravings does not provide a quantifiable time relationship, it is argued that where engravings are located on top of each other, and subject to the same environmental conditions, that the more weathered engraving will be the older ones.

Superimposition was identified in the field for each individual motif (see Appendix 3), noting superimposition order by motif number. Discussions were held between team members to verify order of superimpositions for a selection of motifs. This was done in a way as not to bias either party i.e. superimpositions were assessed without knowledge of assessments made by the other party. Additionally, field assistants were not informed of the McCarthy (1962) sequence, and consequently were not making decisions within this established framework.

Where superimposition order could not be determined the presence of superimposition was noted, but no proposed sequence noted. In approximately 19% of superimpositions it could not be determined whether motifs were either above or below i.e. no sequence was observable; and in an additional 6% of superimpositions not all motifs within a given superimposition could be ordered i.e the complete sequence was not observable.

During the data audit phase, high resolution photography was examined as a secondary confirmation of superimpositions recorded in the field. For the majority, as highlighted in Figure 5.14, superimposition order is visible from these photographs. The ability to ‘zoom in’ allowed identification of individual peck marks, and logical unpacking of superimposition order at magnification. This specifically relates to the large panels recorded by monopod, as key superimpositions were identified in-field (approximately 25%), particularly for instances of greater than three layers of superimposition, with the remainder identified via digital photographs.

**HARRIS MATRIX COMPOSER**

A Harris Matrix is an archaeological tool, traditionally used in an archaeological excavation to organise stratigraphy (Harris 1975). The principles that apply to excavated deposits are now being applied to rock art panels where multiple superimpositions provide layers of art creation.
(e.g. Boyd 2016; Chippindale et al. 2000; Harris and Gunn 2017; Pearce 2006). *Harris Matrix Composer* is a software program that is used to organise superimposition relationships, in the same way that stratigraphic units in archaeological excavations are arranged (see Boyd 2016). Motifs are added into a Harris Matrix, as events, objects or layers would be from within an excavation, and the identified superimposition relationships are added between motifs. Within a given example, the top unit in a matrix diagram represents the interface of the uppermost engraving with the atmosphere (which equates to the ground surface in an excavation) and the ground unit in the matrix represents the bottom-most engraving which equates to the bedrock (or the basal layer of an excavation sequence. The useful adaptation for rock art research that this program also allows for like-types, or styles, to be grouped into phases, allowing for analysis of stylistic sequences within the rock art. This means that the program goes beyond creation of a flow chart or diagram. This grouping involves the user selecting entered motifs to include within phases (identified styles), and the benefit of using this software is that the program then rearranges the matrix to accommodate and stratigraphically order superimpositions by the larger phase. This is indicated by individual motifs boxes being enclosed in a larger shaded box, and directional arrows indicating superimposition from the top of the diagram to the bottom. This function allows for testing of whether identified styles or phases are consistently superimposed, or contradict perceived patterns, as the directional arrows between phases will not flow from the top to bottom, if there are inconsistencies.

It is possible that superimposition has little time-depth or relevance as a marker of temporal change: i.e. motifs created in the same cultural period will occur over and under other motifs created in the same production phase. The consistent superimposition of specific motif classes, as well as the potential for creating compositions/scenes and changing or creating meaning through the arrangement and composition of multiple engravings, creates other possible outcomes. The narrative qualities around particular combinations of motifs, or repeated superimpositions, provide another avenue for exploring meaning in rock art, and fits within a broader cultural system of story-telling. To explore this narrative-potential further, spatial analysis of motif choice was undertaken, with a focus on superimpositions and accumulations of engravings from densely covered complex panels. The panels used for this analysis are those recorded using a monopod in the field, with the images stitched together using Adobe Photoshop CS6. This allows for engravings to be ‘read’ within a broader spatial context of associated engravings and their interaction with the rock surface. The interaction with natural features, such as the use of vughs or large holes in the rock surface, as well as other motifs, is central to this analysis.
STYLE AND SEQUENCING

The methods employed in this thesis are aimed at characterising the Marapikurrinya rock art by analysing stylistic variation. Styles will be defined using the variables outlined above. These proposed styles will be used to test the validity of McCarthy’s (1962) stylistic sequence, and to demonstrate if there is diachronic stylistic variability through time. This will be explored through superimposition analysis – as outlined above – using Harris Matrix Composer. Any changes within the rock art styles through time will then be correlated with other evidence for environmental and archaeological changes. The purpose of undertaking relative sequencing of the Marapikurrinya rock art is not only to test the validity of McCarthy’s sequence, or to determine a relative chronology, but also to look at the placement of motifs in scenes through superimposition and clustering of motifs (Blundell et al. 2010). Superimposition is not merely a result of change through time, but is a result of active meaning construction (Blundell et al. 2010:3). Where stylistic change is not observed between superimpositions, this alternate (i.e. non-diachronic) framework will be explored further. Patterns detected within these variables were assessed statistically using statistics package ‘R’, to confirm patterning and the significance and strength of observed patterning.

DESCRIPTIVE AND INFERENTIAL STATISTICS USED IN THE ANALYSIS

Statistics have been used to test and validate identified patterns of similarities and differences between motifs and identified style groups. The statistical tests used are basic measures of diversity (i.e. Chi Square and ANOVA with Tukey correction), used as aids to confirm whether perceived differences in motif count and frequency are showing significant variation. This is done to address questions about relative homogeneity or heterogeneity within motif types, and between motif types and classes.

Where it can be shown that style is changing through time, the strength of perceived changes is quantified to examine how particular patterns in the rock art may be reflecting other changes within the social group. These choices, following a style based and Information Exchange Theory theoretical approach, should allow an examination of how people are presenting their group identity and potentially how this practice changes with time.

SUMMARY

The Marapikurrinya rock art assemblage provides a rich case study with which to explore how style has been used to negotiate group identity. This rock art body will be used to examine and test theories about progression of styles, and temporal tethering of these styles to other archaeological and environmental data.
To fully understand how this repertoire reflects and asserts group identity, the track and geometric components are included with the less numerous figurative motifs, looking at frequencies by type and class, and involvement in superimpositions. This inclusion counters bias in sampling allowing a more representative sample of the population of multi-phase art to be analysed as a corpus. This is essential to any study of group boundary of identity formation. Stylistic analyses, combined with superimposition analysis and the analysis of scenes/compositions, allow an examination of changing group signalling practice through time in the proposed Marapikurrinya style(s). Specifically, it allows an evaluation of whether the perceived distinction between vocabularies (i.e. figurative figures, track and geometrics) is plausible.

Marapikurrinya rock art has been recorded by numerous researchers since the earliest exploration in the region (e.g. Cleland and Giles 1903), through to recent development-led investigations (Warren 2001). McCarthy's (1962, 1965) recording of over 7000 engravings in the 1950s led to his proposal of a pan-continental stylistic sequence. Whilst this sequence has been discounted at a continental level, its relevance as a local sequence can be tested.

I argue that through the use of style (as presented in Chapter 2), rock art can be analysed systematically like other archaeological material. A taxonomical approach is used, identifying motifs at class (e.g. anthropomorph) and type (e.g. Minyiburu) level, recording attributes and variables to identify the style(s) evident in Marapikurrinya rock art. Style is seen as a vehicle for information exchange (Wobst 1977, 1999), and for this research key information within style includes group identity markers.

By classifying what constitutes the Marapikurrinya style, comparisons can then be made at a regional level, comparing Marapikurrinya with neighbouring Pilbara rock art repertoires, both along the coast and into the arid hinterland. It is recognised that there may be multiple styles within the Marapikurrinya repertoire, and that these may reflect temporal and other variations.

McCarthy's (1962) Port Hedland model is tested (see also McDonald and Harper 2016). To test McCarthy's local sequence all recorded motifs were initially classified using his schema. This is based primarily on form as McCarthy's technique classifications (outside of his Abraded Groove phase) are difficult to replicate. McCarthy's technique definitions have already been criticised (Moore 1988) as being overly-complicated and difficult to apply on the ground.

By focussing on form, broad stylistic differences can be discerned. Here I define and will compare outline, linear, and infilled motifs. Whilst some motifs are a combination of these three forms, they provide broad form categories. By recording attributes (particularly form, size and
content), revised Marapikurrinya styles are proposed, and diachronic change is tested through superimposition analysis.

Some researchers have argued that Marapikurrinya presents an essentially homogeneous assemblage, allowing for greater infill and patterning over time (Maynard 1979; Rosenfeld 1988:34). While the entire assemblage is likely mid- to late Holocene, the complexity of this repertoire is argued to be the work of many generations of people, and potentially different cultural groups, producing observable and quantifiable changes in stylistic depictions through time.
CHAPTER 6: RESULTS - IDENTIFYING STYLES IN THE SOUTH WEST CREEK 4 AND MOURAMBINE KARIYARRA 3 ROCK ART ASSEMBLAGES

INTRODUCTION

This chapter examines stylistic variability across Marapikurrinya engravings. This analysis aims to explore the degree of stylistic homogeneity within the engraved repertoire, and determine whether there are discrete sequential styles. The Marapikurrinya engraving assemblage is examined for motif choice (McDonald 2008; see also Clegg 1987; Officer 1984; Franklin 1984; Smith 1989) and spatial distribution.

In defining the style(s) of this engraved assemblage technique, form and size will be explored as having the potential for being encultured i.e. reflecting social/cultural ways of doing (Clegg 1987; Munn 1973; Sackett 1982, 1990). However, it will be argued that the form of motifs appears to provide the primary variable for identifying stylistic patterning within the Marapikurrinya rock art. Three styles are identified: Outline/Patterned Figurative, Linear Schematised and Infill/intaglio Naturalistic. These do not conform entirely with McCarthy’s original (1962) classification. This proposed style sequence is tested in Chapter 7.

Key themes identified within motif classes involve comparison between marine and terrestrial fauna, and figurative and non-figurative motifs. These dichotomous thematics will be used to argue that different signalling practices deploy different parts of the engraved repertoires i.e. that there is localised territorial signalling operating alongside open/bounding Pilbara-wide signalling. These two vocabularies (figurative, and track and geometrics) work together and are spatially associated, but it will be argued that they have different functional purposes, particularly looking at the relationship between local and regional identity. This interpretation of style and function fits within a broad understanding of the locally distinctive languages across the arid Pilbara, which maintain high neighbour intelligibility and multilingualism. That is, the Pilbara languages form a regional language family – Ngayarda (Dench 1994; Oates 1975; O'Grady et al. 1966) – while distinctive localised cultural and language groups are maintained within this broader regional culture.

Here, engraving technique is discussed, and a summary provided of the repertoire composition at a motif class level, looking at form and size variables. This discussion leads into the proposed Marapikurrinya style(s), both figurative, and track and geometric. The spatial arrangement of
these motif classes and styles are summarised, addressing patterns within different sub-sites within the larger island site complexes (i.e. MK3 and SWC4).

**TECHNIQUE**

Technique plays a role in any group's implementation of style. Rosenfeld (1988) proposed that whilst motif content is the primary culturally meaningful characteristic of an engraving, technique is also a marker of cultural tradition.

Several engraving techniques which combine indirect percussion and friction methods (as defined in Chapter 5) were noted during recording: sometimes more than one technique (e.g. Pecked and Abraded) was observed for each motif. These observed techniques were:

- Abraded;
- Incised;
- Manual (Ground);
- Pecked; and
- Pounded.

To implement these techniques a few engraving tools have been proposed for Marapikurrinya. Little research has been undertaken globally around engravings tools. However, here locally available *Terebralia sp.* shells are singled out as potential hammers:

"Experiments were conducted with whelk shells which produced perfect reproductions of the conjoined puncture and pecked figures, and as these shells are plentiful in the area, common in shallow middens on and beside the limestone ridges, they could have served the purpose of engraving tools" (McCarthy 1962: 2).

During fieldwork, many *Terebralia* shells were encountered on and around engraving panels, as well as live shellfish amongst the mangroves that fringe the tidal islands. Some tips of weathered 'dead' shells were visibly snapped, but whether this is a natural process, or through their use as engraving tools, is unclear.

Alternately, engravings may have been made with stone hammers. One such potential engraving tool was identified on MK3, found in association with engravings (see Figure 6.1). This long thin piece of calcarenite, battered on its tip, was wedged in a narrow vugh of an engraved boulder. This stone appears to be morphologically like the one identified by Lorblanchet (1992; reported by Mulvaney 2010: 295) on the Burrup Peninsula (Figure 6.2).
The majority of all motifs are either Pecked (n=4835, f=57.6%), or Pecked and Abraded (n=3331, f=39.7%). A small number of engravings including Pounding (n=133) and Incising (n=17). The relative softness of calcarenite, combined with natural weathering and erosion, means that visually it was often difficult in the field to distinguish technique for older and weathered engravings. With weathering, pecked lines soften and appear abraded, reducing the
usefulness of including technique in this style analysis. What was visible in less weathered engravings was that different-sized peck marks are discernible across many motif subjects and forms. Some motifs have very small, sharp peck marks, and others have large, rounded peck marks, suggesting different-sized hammers are used. Whilst this was often noted during recording, it was not recorded systematically. Analysis of technique will thus form a minor component of these results. The following discussion of stylistic choice will look substantively at motif choice, form and size.

**Motif Choice by Class**

Stylistic choices made by Marapikurrinya artists will be discussed here, first by outlining broad patterns in motif class frequency, followed by a more detailed analysis of stylistic characteristics observable in certain motif subjects. A total of 8320 engravings were recorded across the two key sites (Table 6.1, Figure 6.3). A number (73) of grinding patches and grooves were also recorded.

<table>
<thead>
<tr>
<th>Motif Class</th>
<th>Count</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geometric</td>
<td>3954</td>
<td>47.5</td>
</tr>
<tr>
<td>Tracks</td>
<td>2569</td>
<td>30.9</td>
</tr>
<tr>
<td>Material Culture</td>
<td>898</td>
<td>10.8</td>
</tr>
<tr>
<td>Zoomorphic</td>
<td>568</td>
<td>6.8</td>
</tr>
<tr>
<td>Anthropomorphic</td>
<td>192</td>
<td>2.3</td>
</tr>
<tr>
<td>Amorphous</td>
<td>114</td>
<td>1.4</td>
</tr>
<tr>
<td>Phytomorphic</td>
<td>20</td>
<td>0.2</td>
</tr>
<tr>
<td>Therianthropic</td>
<td>5</td>
<td>0.1</td>
</tr>
<tr>
<td><strong>Grand Total</strong></td>
<td><strong>8320</strong></td>
<td><strong>100.00</strong></td>
</tr>
</tbody>
</table>

*Table 6.1 Count and Frequency of all Motifs by Class*

Almost half of the motifs recorded are geometrics, while almost a third are tracks (of which 839 are human hands and feet). Material Culture items account for the next largest motif class, followed by Zoomorphs, Anthropomorphs, Phytomorphs and Therianthropes respectively. Anthropomorphs are present in considerably lower numbers than found in other Pilbara regions, while the proportion of material culture in the repertoire is higher (Table 6.1).
**SpatiaL Distribution of Motif Class: inter-isLAnd**

Equal time was spent recording rock art on tidal islands South West Creek 4 (‘SWC4’) and Mourambine Kariyarra 3 (‘MK3’) (Figure 6.3).

![Mourambine Kariyarra 3 and South West Creek 4 at high tide (top) and towards low tide (bottom) (NearMap)](image)

**Figure 6.3** Mourambine Kariyarra 3 and South West Creek 4 at high tide (top) and towards low tide (bottom) (NearMap)

Larger, more complex panels with higher levels of superimposition were encountered on SWC4. This resulted in more recording via monopod to produce accurate 3-dimensional models (see Chapter 5), from which the contextual relationship between motifs, and motifs and the rock surface will be explored (see Chapter 7).
A total of 4895 engravings were recorded on SWC4, and 3425 engravings were recorded on MK3 (see Table 6.2, Figure 6.5). A low density scatter of engravings (< 100) at the eastern end of SWC4 was observed, but not recorded due to time constraints.

<table>
<thead>
<tr>
<th>MOTIF CLASS</th>
<th>MK3</th>
<th>% (TOT)</th>
<th>% (MK3)</th>
<th>SWC4</th>
<th>% (TOT)</th>
<th>% (SWC4)</th>
<th>TOTAL</th>
<th>% TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geometric</td>
<td>1717</td>
<td>43.4%</td>
<td>49.2%</td>
<td>2237</td>
<td>56.6%</td>
<td>45.65%</td>
<td>3954</td>
<td>47.5%</td>
</tr>
<tr>
<td>Track</td>
<td>889</td>
<td>34.6%</td>
<td>25.5%</td>
<td>1680</td>
<td>65.4%</td>
<td>34.3%</td>
<td>2569</td>
<td>30.9%</td>
</tr>
<tr>
<td>Material Culture</td>
<td>374</td>
<td>41.7%</td>
<td>10.7%</td>
<td>524</td>
<td>58.4%</td>
<td>10.7%</td>
<td>898</td>
<td>10.9%</td>
</tr>
<tr>
<td>Zoomorphic</td>
<td>296</td>
<td>52.1%</td>
<td>8.5%</td>
<td>272</td>
<td>47.9%</td>
<td>5.6%</td>
<td>568</td>
<td>6.9%</td>
</tr>
<tr>
<td>Anthropomorphic</td>
<td>95</td>
<td>49.5%</td>
<td>2.8%</td>
<td>97</td>
<td>50.5%</td>
<td>2.0%</td>
<td>192</td>
<td>2.6%</td>
</tr>
<tr>
<td>Amorphous</td>
<td>46</td>
<td>40.4%</td>
<td>1.3%</td>
<td>68</td>
<td>59.6%</td>
<td>1.4%</td>
<td>114</td>
<td>1.0%</td>
</tr>
<tr>
<td>Phytomorphic</td>
<td>6</td>
<td>30.0%</td>
<td>0.2%</td>
<td>14</td>
<td>70.0%</td>
<td>0.3%</td>
<td>20</td>
<td>0.2%</td>
</tr>
<tr>
<td>Therianthropic</td>
<td>2</td>
<td>40.0%</td>
<td>0.1%</td>
<td>3</td>
<td>60.0%</td>
<td>0.1%</td>
<td>5</td>
<td>0.0%</td>
</tr>
<tr>
<td>Total</td>
<td>3425</td>
<td>41.61%</td>
<td>100.00%</td>
<td>4895</td>
<td>58.38%</td>
<td>100.00%</td>
<td>8320</td>
<td>100.00%</td>
</tr>
<tr>
<td>GRINDING PATCH</td>
<td>68</td>
<td>93.15%</td>
<td>1.95%</td>
<td>5</td>
<td>6.85%</td>
<td>0.10%</td>
<td>73</td>
<td>0.0%</td>
</tr>
</tbody>
</table>

Table 6.2 Motif Class counts and frequencies by site

Figure 6.4 Comparative Motif Class Frequencies by Site
Motif class frequencies between these two islands are similar. While this indicates general cohesion between these two islands (Table 6.2, Figure 6.4), there are some notable differences. For instance, MK3 has a significantly higher number of grinding patches recorded in association with engravings (see Table 6.2) SWC4 also has a larger number of engravings, and higher densities of these (Figure 6.6). MK3 also has higher frequencies of Anthropomorph and Zoomorph categories than SWC4. Site SWC4 has a higher frequency of all tracks, and a slightly lower frequency of geometrics, than found on MK3.

The engravings density distributions for both islands were generated using kernel density calculations in GIS software ArcGIS (Figure 6.5 and 6.6). These density maps show that the larger SWC4 has an area of very high density on the main southern ridge, with discrete areas of engraving along other ridgelines. In contrast, on MK3 there is near continuous engraving along the main ridgeline, with an additional area of high density in the central section of the island.
Figure 6.5  Site South West Creek 4 Density Map for all engravings
Figure 6.6 Site Mourambine Kariyarra 3 Density Map for all engravings
THE MARAPIKURRINYA ROCK ART STYLE

Three styles were identified within the Marapikurrinya repertoire (Figure 6.7), classified through a combination of form (Figure 6.8), size and motif content. Some motifs fall outside of these three styles where they lack diagnostic features, and two distinctive anthropomorph types (Minyiburu and Murra Murra) have been classed as sub-styles within the Outline/Patterned Figurative style.

![Figure 6.7](image_url) The three distinct styles identified within the Marapikurrinya repertoire (Outline/Patterned Figurative – Mustard; Linear Schematised – Blue; Infill Naturalistic – Red)

1. **OUTLINE/PATTERNED FIGURATIVE**

This style comprises a series of outline, and outline and infill/patterned motifs (Figure 6.7). Dominant motif classes within this style are marine fauna, material culture and anthropomorphs. Marine fauna includes a variety of fish, shark, dugong and whale, turtle, stingray and jellyfish, and of note, most zoomorphs are outline in form (~82%, Figure 6.8). There is a large material culture component in this group including shields, spearthrowers, boomerangs, axes, spears and shoes. Whilst approximately half of all anthropomorphs include an outline component (this includes some Minyiburu and Murra Murra), human figures within this style are fully enclosed. Outline tracks are rare (chi-square of tracks by form, p-value is < 2.2e-16, due to the significant difference in sample size between track forms observed), with 41 examples only amongst the 2569 tracks recorded (Figure 6.8).

Internal patterning across this style is varied, from none to complex designs including concentric and parallel banding. Across material culture this patterning is highly variable, and it is argued relates to patterning seen on the physical objects they correlate with (e.g. shields), rather than the patterning reflecting changes in style, as suggested by McCarthy (1962). This
patterning is analysed across motif type to look at consistencies in form, and further in Chapter 7 to determine whether there is unidirectional development from outline to sequentially more detailed infill patterning.

Most of the motifs in this style are 'life-size' i.e. a shield engraving is approximately the same size as examples of shields collected in this region. This is also true for the zoomorphs and anthropomorphs, with a tendency towards larger than life marine fauna motifs.

There are some outline geometrics, particularly circles and ovals – which are by their nature going to be either an outline or infill form; an array of Simple Non-Figuratives, and some uncommon geometrics include gourd, triangle and square shapes. These motifs are not explicitly included in this style, as they are not figurative, and don’t meet enough of the style criteria outside of form. However, their position within superimposition sequences will be examined in the next chapter, to determine whether they are consistent with superimposition patterns for other outline motifs explicitly included in this style.

In-Between Outline Styles? Minyibur and Murra Murra

The two unique Marapikurrinya anthropomorphs, the Minyiburu and Murra Murra differ from other outline anthropomorphs within the Outline/Patterned Figurative style. However, they fit within the continuum of this style when assessing a combination of form elements – use of outline, as well as internal patterning.

The Minyiburu figures are a highly heterogeneous form, which have been divided into sub-types (see detail below). Their dominant form is outline, with inverted U-shaped bodies usually enclosed by a horizontal line delineating body from legs, or head from body. But these enclosing lines are not a feature of all motifs. The arms and legs, and some bodies are linear in form. A handful of motifs have outline arms; and there is a common addition of infill/intaglio hands and/or feet. It was this combination of forms that confused McCarthy (1962), who suggested that the hands and feet had been added to these figures at a later time. And indeed, this combination of forms may suggest that this figure is created at different times throughout the sequence at Marapikurrinya (see Chapter 7). A pair of closely-spaced dots for eyes is common in this figure, and this is a similar graphic vocabulary to many Zoomorph motifs in this style. The size ranges vary markedly, with examples between 54 to 268 centimetres in length.

The Murra Murra figures are also a heterogeneous group, however not as diverse as the Minyiburu. This group has also been divided into sub-types, and is discussed in more detail below. The dominant form for these anthropomorphs is linear/patterned, being a series of parallel lines. However, a few examples have an outline component, with an enclosing line
around the parallel lines. Size across this motif style is highly variable, from 40 centimetres to six metres in length.

Superimposition analysis will aid sequencing of these motif types, against each other, and within the broader sequence.

2. **LINEAR SCHEMATISED**

This linear style is highly schematised and is applied particularly to the track and material culture motif classes, in addition to some anthropomorphs (Figure 6.7). ‘Schematised’ here is defined as a simplified and symbolic representation of a thing, e.g. the use of a linear trident to indicate a bird track. Common motifs include bird and lizard tracks, and spears (n=279), with varying barb arrangements. The distinctiveness of this style is validated by some motif types occurring in other style groups: for example, bird tracks are also found in the infill style and some spears have outline forms.

Many geometrics are linear in form. In particular, there is a large component of straight and meandering lines (n=675), including many long lines (up to 340 centimetres), arcs (n=357) and fringes (n=216). However, not all geometric linear motifs are necessarily included in this style, particularly lines, arcs and other simple geometrics, as beyond their linear form they lack diagnostic features to include them in this style.

The track and spear motifs are generally smaller than life-size, except for a few very long spears. Of the three identified styles this is the most economical, in terms of time-cost to produce each engraving.

3. **INFILL NATURALISTIC**

This style is usually characterised with tracks and zoomorphs, but includes two rare anthropomorphs. It is characterised by inclusion of anatomical detail (Figure 6.7), hence the name Infill ‘Naturalistic’. Both macropod and bird tracks are included in this style, with a small scattering of dingo tracks and human hands and feet that are life-sized, and anatomically detailed. There is considerable stylistic variety amongst human footprints, and not all are associated with this style.

Both marine and terrestrial fauna are included in this style, including snakes, lizards, crabs, stingrays and some fish motifs. Zoomorphic motifs in this style are life-sized: large macropod and bird tracks suggest kangaroo and emu (with recognisable anatomical details in these tracks: McDonald 1993).
**Figure 6.8** Frequency of outline, linear and infill figures by motif class

**Persistent motifs outside of these style groups**

There are Marapikurrinya motifs which are not included in these stylistic groupings, but rather form a fourth group in which the three distinctive styles are nested. Whilst this may seem to negate the identification of explicit style groups, it is argued that many motifs fall within a persistent style, or way of doing, that is not specific to this place, and therefore is not considered territorially or diachronically significant. These persistent motifs are argued to reflect isochrestic style (Sackett 1990), as opposed to active iconological style (Wiessner 1990). They do not include sufficient features used to classify the iconological styles above, and whilst all infill motifs could be grouped together, it is the combination of size and naturalism that makes this style explicit. Many of these motifs are from the geometric repertoire, where form is closely linked to shape i.e. lines are linear. It is argued that these persistent motifs fit within a broader Pilbara-wide iconography, and relate to the arid-zone track and geometric style(s).

This analysis now examines Marapikurrinya motifs, to define the identified styles at a type and class level.
THE MARAPIKURRINYA FIGURATIVE REPertoire

The figurative motif classes identified at Marapikurrinya are: Anthropomorphic, Material Culture, Phytomorphic, Therianthropic, and Zoomorphic (Table 6.3). Each class is reviewed individually, and then compared to assess stylistic consistency.

<table>
<thead>
<tr>
<th>Motif Class</th>
<th>Count</th>
<th>%</th>
</tr>
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<td>7.1</td>
</tr>
<tr>
<td>Material Culture</td>
<td>898</td>
<td>55.9</td>
</tr>
<tr>
<td>Phytomorphic</td>
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</tr>
<tr>
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</tr>
<tr>
<td><strong>Total</strong></td>
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<td>100.0</td>
</tr>
</tbody>
</table>

Table 6.3 Frequencies of Figurative motifs

**Anthropomorphs**

A total of 192 anthropomorphs were recorded across sites SWC4 and MK3 (Table 6.4). While this is the third largest figurative class recorded (Table 6.3), it comprises just 2.3% of the entire assemblage.

This does not fit the broader Pilbara pattern of anthropomorphic dominance (see McDonald and Veth 2013a). The Murujuga anthropomorphs comprise 22% of that assemblage; at Woodstock-Abydos 23.8% and at Cooya Pooya 82.8% of the assemblage. The Murujuga and Woodstock-Abydos datasets contain approximately 3000 motifs each – providing robust samples for comparison (see Chapter 4).

Another point of difference in the Marapikurrinya repertoire is that these human figures are not dominated by stick figures or other small, stylised humans. Rather there are two types of simple but distinctive human types which have been interpreted as culture heroes: *Minyiburu* and *Murra Murra* (see Table 6.4, Figure 6.9). These types were named by Kariyarra man Captain George (McCarthy 1962).
<table>
<thead>
<tr>
<th></th>
<th>MK3</th>
<th>SWC4</th>
<th>TOTAL</th>
<th>%</th>
</tr>
</thead>
<tbody>
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<td>13</td>
<td>35</td>
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<td>24.9%</td>
</tr>
<tr>
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<td>17</td>
<td>47</td>
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<tr>
<td>Outline</td>
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<td>13</td>
<td>26</td>
<td>14.0%</td>
</tr>
<tr>
<td>Murra Murra</td>
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<td>12</td>
<td>28</td>
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<tr>
<td>Composite</td>
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<td>3</td>
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<td>4.7%</td>
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<td>6</td>
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</tr>
<tr>
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<td>1</td>
<td>1</td>
<td>0.5%</td>
</tr>
<tr>
<td>Dotted</td>
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<td>1</td>
<td>1</td>
<td>0.5%</td>
</tr>
<tr>
<td>Patterned</td>
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<td>1</td>
<td>1</td>
<td>0.5%</td>
</tr>
<tr>
<td>Mermaid</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0.5%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>95</td>
<td>97</td>
<td>192</td>
<td>100%</td>
</tr>
</tbody>
</table>

Table 6.4 Anthropomorph classes count by site and overall frequency

Figure 6.9 Minyiburu (left) and Murra Murra (right) human figures (Not to scale)
The Minyiburu style is a distinctive upside down U-shaped human figure, often with a rayed headdress or hair, facial features, gendering, and large infill hands and feet (see Figure 6.9). The Murra Murra motif is visually and stylistically different to the former: being a generally large, long human figure made up of parallel lines (see Figure 6.9). One attribute, that may link the two figures is the rayed headdress (seen commonly with the former), and the head shape of the latter – both vertical parallel lines. This attribute is common, but not consistent across all motifs from these two types. These two motifs are rarely found in association (see Chapter 7), with one exception where they are engraved adjacent to each other on a complex panel.

While the 'stick' and 'outline' categories make up 24.4% and 14% of the anthropomorph assemblage respectively, these broader groupings have little internal conformity.

Some inter-island differences can be seen in anthropomorph motifs (see Figure 6.10). The majority of Minyiburu figures are located on SWC4 (72.9%), while stick figures have a much higher frequency on MK3 (63.8%). Murra Murra figures are found in similar frequencies across both islands (MK3=57.2%; SWC4=42.8%).

![Figure 6.10 Stacked column graph comparing anthropomorph counts by motif type and site](image)

The distinctiveness of the Minyiburu and Murra Murra figures fit within McDonald and Veth’s proposal that “the style of the anthropomorphs [are] the dominant evidence for stylistic variability between the Pilbara provinces” (2013:76). Interestingly, however, stick figures are almost as dominant as Minyiburu, and are present in greater numbers than Murra Murra.
Minyiburu

The Minyiburu have received the most attention of any motif type across Marapikurrinya, and have been labelled as a ‘distinct group having no relationship to any other series’ (Wright 1977:114, also McCarthy 1962; Petri and Shulz 1951; e.g. Figure 6.11). The uniqueness of this motif across the Pilbara singled out this type for detailed analysis. This analysis included an analysis of connections made between these figures and defined ancestral beings.

**Figure 6.11** Minyiburu figures with associated motifs, displaying heterogeneous sub-types (Left to Right: Wright 1977, 23s-041a, 12-004a)

Minyiburu are the most frequent anthropomorph type recorded in the assemblage. For this analysis, data collected from across Marapikurrinya sites – additional to SWC4 and MK3 – have been included (Zubieta and McDonald 2015). As shown in Figure 6.30, 66 Minyiburu figures were recorded across 2013-2014 providing a slightly larger sample to explore this distinctive figure. This motif is found at all sites across Marapikurrinya (Figure 6.12), and is the most frequent anthropomorph type across all sites, with 13 recorded on MK3 and 35 on SWC4.

Whilst being the most researched motif from the Marapikurrinya assemblage, defining this anthropomorph type is difficult. McCarthy (1962) concluded that Minyiburu figures were more frequently female than male; that these were associated with vughs; had rich clothing and other paraphernalia such as pearl shell breast ornaments, chest banding and pubic fringes; and were frequently associated with emu eggs, snakes, shields, human footprints and that many were speared through.
The key attributes defined for this motif include: U-shaped body, a combination of infill hands and feet, faces and arms held akimbo or aloft, gendering, and facial features. Analysis shows that whilst distinctive, this motif class includes considerable stylistic variability. Uniqueness and consistency of form are explored here to confirm this motif type, and to identify internal variability (see Figure 6.13).

The following variables were recorded to describe stylistic variation across this motif:

- **Body Shape:** U, U-irregular, U-splayed, U-rectangular, U-naturalistic;
- **Head Shape:** Dome, Squared-dome, Circle, Oval;
- **Face:** Eyes, Nose, Mouth, Chin, Vugh;
- **Gender:** Female, Male, Female/Male, ungendered;
- **Hands:** Presence; Form: Infill, Infill + Linear, Linear;
- **Feet:** Presence; Form: Infill, Linear;
- **Arms:** Presence; Form: Linear, Outline;
- **Legs:** Linear, Linear and Outline, Outline;
- **Headdress:** Presence; Rayed, Arc, Line, U, Complex;
- **Clothing/Adornment:** Breast Circles, Dots, Banding, Chest Plate, Pubic Fringe, Pendants; and
- **Material Culture:** Boomerang, Spear, Shield.

These attributes will be discussed in turn.
Body and head shape across Minyiburu is variable, and by comparing these shapes a series of sub-types were developed (Figure 6.13):

- **Classic**: U-shaped body, bisected by the arm line which forms the neck line, hands and feet most commonly infilled, face includes eyes and mouths, and may include a headdress (most commonly rayed), may or may not be gendered;
- **Simple**: This is the most common type recorded, U-shaped open body with no demarcation for neck or base of torso;
- **Simple with Neck**: U-shaped body, with a line separating the head from the rest of the body, that isn’t associated with the arms;
- **Simple with Baseline**: U-shaped body, where the base of the body is made by a horizontal line, hands and feet are intaglio;
- **Simple with Baseline/Legline**: U-shaped body, where the bottom line is made by the legline, with horizontal legs;
- **Simple with Separate Head**: Rough U-shaped body, more commonly asymmetric, and the head is made by an additional shape attached to the body line, increasing complexity from above sub-types, more likely to be gendered and with some form of body decoration;
• Square Headless: Square shaped outline body, no obvious head;
• Vertical Bodies: Two distinct examples whose vertical internal banding dominates the design (similar to Murra Murra);
• Outline Arms: Unlike all sub-types above, these have outline arms, attached to U-Shaped bodies, increasing variability amongst these figures;
• Outline Arms and Legs: Arms and legs both outline, U-shaped body;
• Linear: Bodies irregular meandering line U-Shaped, dome heads; and
• Complex: catch-all subtype for several distinct large figures, complex faces, part of complex scenes.

It is argued that these sub-types represent clinal change amongst this anthropomorph class, including changes from linear to outline arms and legs, separation of the head from the body line, and changes to the shape of the head. Some sub-types present more internal homogeneity than others (such as the Simple forms). Uniting these various sub-types, and defining these figures as Minyiburu, remains the U-shaped body.

**Faces**

Facial features are common on Minyiburu: while being a rare feature for many Australian engraved anthropomorph repertoires (Dix 1977). The most common features are eyes, mouths and noses: a number have non-diagnostic scattered marks (see Figure 6.14). Most Minyiburu have eyes (47: 71.2%), 13 have mouths (19.7%) and eight have noses (12.1%). Eyes are found across all groups (excluding SBL and Sq types). Complete faces which include noses and mouths are only seen in two of the subtypes: SH and Cx, distinguishing these two types. There are also examples of vughs within heads in place of a face (n=6), from five different subtypes.

![Figure 6.14 Selection of Minyiburu faces](image)
**Sex/Gender**

Both Wright (1977) and McCarthy (1962) discussed the common frequency of female gendering across Minyiburu figures, particularly the placement of the engraved motif around a vugh to suggest female genitals. For this study, either presence of a vugh in place of female genitals, or engraved male or female genitals were used as identification of female, male, female+male or non-gendered. Of the sample analysed here, 37.3% were identified as female, 4.5% as male, but 58.2% as non-gendered. Of the females, approximately half of these had engraved genitalia, while the other half was designated as female based on the engraving’s placement relative to a vugh, inferring a vulva. Of the male figures genitalia is suggested by a central line between the legs. The explicitness seen in the female motifs is not replicated with the male figures. When comparing Minyiburu to Murra Murra (discussed in more detail below), the former are more likely to be female than male, and amongst the latter there is a more even balance between female and male figures. Where there are male Murra Murra, their genitalia are explicit, unlike the Minyiburu males. This suggests that there is different gendering and associated stories around the identity of these two iconic anthropomorphic types.

**Hands and Feet**

McCarthy’s argument that the Minyiburu figures showed recursivity and reactivation through time with the addition of intaglio hands and feet was not in evidence from this larger sample. Of the 66 motifs, 32 had no hands and 17 had no feet. Of the 34 with hands, 27 were infill. Of the 49 with feet, 45 had infilled feet. Together, 14 motifs had no hands or feet, and 34 had both hands and feet. Visual inspection of these motifs during fieldwork did not support McCarthy’s theory that these hands and feet were later additions to the linear bodies. The overall weathering of motifs’ bodies, hands and feet is consistent, and appears to all be part of the original composition. It is suggested that McCarthy’s reliance on sequential form change across all motif groups (1962, 1988) does not provide evidence for change through time.

**Arms and Legs**

The arms and legs of Minyiburu subtypes vary considerably. Arms, for the majority are linear (79.5%), and the remainder are outline (20.5%). Linear arms are seen across all types, excluding the Outline Arm specific groups (OA, OAL, SH and Cx). Variability in arms shows a stylistic difference in the form of the anthropomorphs, which provides a point of difference. However, a more interesting pattern is seen in variability in the legs of the figures, which have a stronger ‘narrative’ repetition.
Generally, the legs are vertical, and a continuation of the main body line, straight down. However, approximately 30% of the figures have the legs bent outwards, either directly at waist level, or at the knees, ranging from horizontal to 45 degree angles (e.g. Figure 6.15). Of these varieties, 15 are gendered, and five are non-gendered. Of the gendered motifs, 14 are female. Most of the female motifs have legs angled out from their body line: this may be used to infer a connection between leg style and associated gender of these figures.

![Figure 6.15 Angled or bent leg female Minyiburu](image)

A repeated pattern observed is that several figures have additional sets of legs intersecting with their legs (see Figure 6.16). Alternate readings of this include cut legs, with sections of limbs lain over disarticulated legs, or suggestively, or even explicitly, indicating copulation. This repeated pattern is suggestive of narrative clues, regardless of our ability to determine the original meaning of this.
Figure 6.16 Example of Minyiburu with positioned legs (and possible penis) suggestive of copulation (Motif 15s-022a)

Headdresses

Most Minyiburu (43; 65.2%) have no headdress (or hair). Of the 21 figures with a headdress, the most common type is rayed (n=16): either vertical (parallel) and fanned. Four other less common types were recorded: Arc, Line, U, and Complex (see Figure 6.17). Two figures have an Arc headdress, one figure a U headdress, one figure a line, and two figures have different complex headdresses.

These headdresses are found on female, male and non-gendered motifs (Figure 6.17, Table 6.5). Two out of the three ‘male’ Minyiburu have a headdress, and neither of these is the same headdresses seen on the ‘female’ Minyiburu, of whom nine have a rayed headdress, one a complex headdress, and 16 have no headdress. The majority of non-gendered Minyiburu have no headdress, followed by rayed headdresses, and one example each of three other headdress types (Table 6.5).
Research on headdress variability across Pilbara rock art (Piercy 2013) used a dataset of 1013 motifs. This work suggested that headdress variability along the Pilbara coast was higher than found in the hinterland, and that their distribution reflected responses to social change and stresses. The splayed headdresses most commonly seen here fit within Piercy's (2013) homogeneous set, argued by her to reflect open social networks across the Pilbara. The remaining designs potentially could reflect closed network in the region. Recording five different style headdresses concentrated in a small area does not suggest a tightly bounded area, unless these headdresses are reflecting change through time, or perhaps aggregations of different groups coming together. Further spatial and superimposition analysis of these variable headdresses may provide a more nuanced understanding of this feature, but the small sample precludes more detailed analysis.

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<td>26</td>
<td>43</td>
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<td>8</td>
<td>16</td>
</tr>
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<td>2</td>
</tr>
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</tr>
<tr>
<td>U</td>
<td>-</td>
<td>-</td>
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</tr>
<tr>
<td>Total</td>
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<td>38</td>
<td>66</td>
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</table>

*Table 6.5 Minyiburu Headdress Count by Gender*
**Figure 6.18** Minyiburu headdress type counts according to gender

*Other Adornments*

The most common adornments on *Minyiburu* figures are chest banding and pubic fringes. Horizontal chest banding, which could suggest the cultural practice of scarification, was seen on 20 (~30%) of the motifs. The numbers of bands recorded range from two to seven. A few examples have transverse banding down the entire body, which may represent something different (this is separate to the Vertical sub-style: Figure 6.13). Banding is seen across eight of the sub-types, from simple through to complex figures.

Pubic fringes were recorded on five individuals, and one oval pendant hung from the waist was also recorded. There does not appear to be a correlation between sub-style or gender of which figures shown wearing these objects, suggesting an individual occurrence as opposed to a repeated narrative. Other uncommon adornments include unidentified dots or outline circles on the chest (possible breasts), and a chest plate/necklace pendant.

*Scenes*

*Minyiburu* figures have been described previously as characterised by their ‘dancing’ postures (McCarthy 1962; Wright 1977). However, as discussed above, most *Minyiburu* have straight legs, and are represented in plan view and fairly statically. This group has relatively high levels of superimposition, including with spear motifs (see Figure 6.19, 06j-035). For example, the complex *Minyiburu* shown in Figure 6.19 has three spears superimposed over its body, two of
these being exceptionally long. The dots on the chest may also indicate spearing, or nipples. This narrative quality, and inclusion of these figure in scenes, will be discussed further in Chapter 7.

Figure 6.19 Speared Complex Minyiburu

Murra Murra

At the centre of the Two Mile Ridge Protected Area is a large human figure (3.6m x 3m) comprised of parallel lines forming the body, arms, legs and head (Figure 6.20).

Figure 6.20 Example of a ‘Murra Murra’ figure (2 Mile Ridge, McCarthy 1962: Figure ‘A1B22-37’)
This figure was recorded by McCarthy (1962), and named by Captain George as *Murra Murra*. Like the *Minyiburu* this spectacular culture hero is found across the Marapikurrinya sites: 16 were recorded at MK3, and 12 recorded at SWC4. Longitudinally striped anthropomorphs are seen elsewhere across the Pilbara (Mulvaney 2010; Wright 1968). However, the size of the Marapikurrinya examples, and presence of striped arms, legs and head appears to be characteristic of the Marapikurrinya motifs, and fits with other banded and internally patterned motifs (e.g. shields).

**Sub-groups**

Five style sub-groups were established amongst these figures; with one group (MMX) covering incomplete/unclassifiable figures (see Figure 6.21):

- **MMA**: Simple, X-shaped bodies formed by two groups of opposing parallel lines;
- **MMB**: Simple, Body, arms and legs all formed by parallel lines, largely perpendicular limbs;
- **MMC**: Parallel line bodies and legs, enclosed dome-shaped heads, arms may be either outline or parallel lines;
- **MMD**: Outline, all internal parts are formed by parallel lines, but all enclosed by an outline;
- **MME**: Combination of MMC and MMD, with the addition of a head, distinct from the main body line.

These style groups most probably represent clinal variability within the accepted schema for this motif type. Within a larger sample, this variability could be explored further.

![Figure 6.21 Murra Murra Sub-Styles](image)

The most common sub-group is MMC (N=11, 31.4%), with MMB and MMA the next most common forms (see Table 6.6).
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</thead>
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</tr>
<tr>
<td>Total</td>
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</tbody>
</table>

**Table 6.6 Murra Murra sub-styles**

**Size**

Size varies considerably for this motif. The largest example measures 625 centimetres in length, with an arm span of 404 centimetres, almost double the length of the 2 Mile Ridge example (Figure 6.20). This huge motif is part of a complex panel discussed in Chapter 7. There are 15 Murra Murra longer than 100 centimetres, ranging downwards in size to 24 centimetres long. For these large engravings, a certain amount of available canvas is required for their creation, from which information around sequencing can be inferred. The three largest examples (over 300 centimetres in length) are each from a different style group (MMB, MMD and MMC).

**Faces**

Unlike the Minyiburu, facial features are uncommon for Murra Murra figures, i.e. ~85% do not have explicit facial figures. Whilst two figures have patterning within their heads, there are only five figures with unambiguous features, and these are all eyes.

**Sex/Gender**

The placement of 15 Murra Murra motifs interacts with vughs. These sometimes are positioned in the same location as their genitals; but others having vughs for their heads and, in one example, at the end of an arm. Vughs are included across styles and sizes, and are discussed here as part of gendering, but may also relate to a broader narrative.

The use of vughs in place of genitals has been interpreted here as representing female gender, with two exceptions (16s-011a), and where the continuation of the body lines between the legs, but leading to a vugh, suggests elements of both male and female gendering. There are two examples of engraved female genitalia (15s-022a and 14-009a), one particularly exaggerated in terms of size, whilst keeping the same parallel line style used for the motif. Male genitalia are also represented in various ways showing much more explicitness (e.g. Figure 6.22) than seen across Minyiburu.
Patterning/Adornment

Two figures have dot infill within their heads (11s-035d and 28-027d): anomalous with the general parallel line form of this motif type. No explicit headdresses were recorded for these motifs, although the parallel lines of MMB figures could be interpreted as rayed headdresses (similar to those commonly seen on Minyiburu as mentioned above). Three figures have linear horizontal chest/waist banding, one figure has wrist bands, and one figure has a band across the left leg, which may represent some kind of adornment. Whilst horizontal banding is seen within marine fauna (fish, marine and turtle examples), vertical banding is otherwise only seen a small number of Minyiburu (n=2), on shields (design E1, discussed below) and spearthrowers.

Other Anthropomorphs

Outside of the Minyiburu and Murra Murra types, there are a handful of other anthropomorphic figures, including infill, outline and stick figures, which are summarised here.

Infill

Eleven relatively rare infill human figures have been recorded (e.g. Figure 6.23).
Figure 6.23 Infill anthropomorphs with rayed headdresses (16s-005; 125-011)

This group demonstrates extreme stylistic heterogeneity; however, they are included within the Infill Naturalistic style based on form and detail. Two figures (Figure 6.23) share some attributes, composed with a chunky, visible pecking, arms and legs bent upwards at elbows and knees, exaggerated male genitalia, and rayed headdresses. One of these has fingers and toes; the other none.

**Stick Figures**

There are 47 stick figures: 30 from MK3 and 17 from SWC4. This follows Vinnicombe's (2002: 18) definition that body, arms and legs are of equal width (cited in McDonald and Veth 2009). These figures fall within the Linear Schematised style. Within this category, eight variations were recorded (see Figure 6.24). In contrast, McDonald and Veth (2009: 58) recorded 67 stick figure varieties from 331 motifs across the Dampier Archipelago. The majority of Marapikurrinya stick figures (n=32, f=66.7%) have a central body line which includes the head and genitalia. Some could be classed as ‘Lizardmen’ (McDonald 1994), given their legs are shorter than their penises.
These types are defined as follows:

- **ST1**: Straight body, arms and legs straight and angled down (n=9);
- **ST2**: Straight body, arms curved up, legs curved down (n=5);
- **ST3**: Straight body, horizontal arms, legs curved down (n=9);
- **ST4**: Straight body, horizontal arms and legs (n=2);
- **ST5**: Straight body, wavy arms and legs (n=3);
- **ST6**: ST1 with horizontal headdress (n=1);
- **ST7**: ST3 with concentric arcs through torso (n=1); and
- **ST8**: Complex stick figure – ST1 with head and hand detail, ungendered (N=17).

The most common type recorded is ST8, which is a group of heterogeneous stick figures included in this class due to their stick figure bodies, however they include outline and infill heads, and hand and feet detail. This group tends to have larger motifs, with two examples longer than 100cm, and three examples longer than 200cm. When looking across average length of types, ST8 has the largest average length (95.4cm), where all other types range from 23 to 37.8cm in average length. There are no particularly small stick figure motifs either, i.e. no motif is shorter than 11cm.

### Outline and Other

There are 13 outline anthropomorphs, in addition to 13 linear motifs (O1 and O2 are probable schematised Minyiburu forms), that do not fully enclose space, but are included in this discussion due to overall morphological similarities i.e. blobbiness. This group is also fairly heterogeneous, (see Figure 6.25).

- **O1**: stylised outline and linear anthropomorphs, elongated and slender (n=4);
- **O2**: similar to Minyiburu, linear outline U-shapes, few attributes (n=5); and
- **O3**: rounded outline humans, includes some facial and other features (n=9).
O1 and O2 motifs likely represent stylised/simplified Minyiburu, which fits with the Minyiburu inclusion alongside these figures within the Outline/Patterned Figurative style.

![O1 O2 O3](image)

**Figure 6.25** Outline anthropomorphs by type

From this small set of anthropomorphs, O3 types are the most common of those that can be classified into a stylistic type (f=50%). There is internal variability within this type, five motifs have eyes, of these one also has a nose, and one other also has a mouth. These motifs fit within the Outline/Patterned Figurative style.

![Outline body, infill hands and feet](image)

**Figure 6.26** Outline body, infill hands and feet, example of a unique motif with some familiar attributes
Of the three types, O3 are most likely to have material culture motifs associated with them i.e. five motifs have a combination of boomerang, spear, shield and rope motifs in association, where one motif from O1 has an associated boomerang, and O2 have no associations. Of the outlined motifs, two are female and two are male, and five are ungendered. Average length increases from O1 (64.5cm) through O2 (87.6cm) to O3 (104.0cm).

Each of the four unique motifs bear little relation to each other, being completely unique besides their outline form. One example is provided in Figure 6.26, where the arms, legs, body and head are outline, however the hair/headdress is linear, and the hands and feet are infill.

**Composite**

A composite group of anthropomorph comprises nine unique forms, where there are multiple motif elements present, combining to make the motif (e.g. Figure 6.27).

This group is highly heterogeneous and shows freedom on the part of the creator. The term composite refers both to form (i.e. like the *Minyiburu* combining linear and infill elements within some motifs) and composition (e.g. attaching a head to a boomerang motif – see Figure 6.27), and these figures do not fit within the established styles.

*Figure 6.27 Example of Composite Human-Material Culture Figure (greyscale indicates different phases of engraving)*
Material Culture

Material Culture forms a significant part of the figurative repertoire (N=898, 10.8%, see Table 6.1), much higher than recorded elsewhere across the Pilbara region (see Chapter 4). As such it forms a key component of the Marapikurrinya style. The presence of repeated designs on these motifs may provide information on identity signalling. Identifiable material culture can be related to known objects e.g. shields, boomerangs or axes. Mulvaney (2010) chose to include material culture wholly within his Geometric class, as:

*If misidentified they are more likely to be simple geometric images than not. A curved line is always an arc, but when it is depicted ‘as held by a human’ it may be regarded as a boomerang...* (2010:152).

There are some motifs that are classified as Geometrics in this study that might represent material culture if ‘read’ with an emic perspective, so the current classification should be read as a minimum, not limited to what Munn (1973) referred to as ‘continuous’ meaning ranges, finding a visual match with objects in the real world (Figure 6.28).

![Figure 6.28 Example of an axe engraving (South West Creek 4, Motif #14-004)](image-url)
Identified material culture includes: axes (e.g. Figure 6.28), bags, baskets, sacred boards, boomerangs, clubs, headdresses, hooked sticks, nets, rakes, rope, shields, shoes, spears and spearthrowers. Some of these motifs are identified by their association with other engravings in scenes, for example a rope/line seen in fishing scenes, where otherwise this motif, recorded in isolation, would be classified as a meandering line.

Across Marapikurrinya however material culture, largely, is not found in association with anthropomorphs, and is distinctive enough to be identifiable (for example, see Figure 6.28; and classification taxonomy: Appendix 4). This will be discussed further below around distinct design elements of many of the material culture engravings.

<table>
<thead>
<tr>
<th>Motif</th>
<th>Count</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Axe</td>
<td>2</td>
<td>0.2</td>
</tr>
<tr>
<td>Bag</td>
<td>8</td>
<td>0.9</td>
</tr>
<tr>
<td>Board</td>
<td>2</td>
<td>0.2</td>
</tr>
<tr>
<td>Boomerang</td>
<td>270</td>
<td>30.1</td>
</tr>
<tr>
<td>Boomerang pairs</td>
<td>16</td>
<td>1.8</td>
</tr>
<tr>
<td>Club</td>
<td>1</td>
<td>0.1</td>
</tr>
<tr>
<td>Fern Headdress</td>
<td>1</td>
<td>0.1</td>
</tr>
<tr>
<td>Hooked Stick</td>
<td>2</td>
<td>0.2</td>
</tr>
<tr>
<td>Net</td>
<td>3</td>
<td>0.3</td>
</tr>
<tr>
<td>Rake</td>
<td>3</td>
<td>0.3</td>
</tr>
<tr>
<td>Rope</td>
<td>7</td>
<td>0.8</td>
</tr>
<tr>
<td>Shield</td>
<td>210</td>
<td>23.4</td>
</tr>
<tr>
<td>Shoe</td>
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<td>1.7</td>
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<tr>
<td>Spear</td>
<td>310</td>
<td>34.52</td>
</tr>
<tr>
<td>Spear with Rope</td>
<td>3</td>
<td>0.33</td>
</tr>
<tr>
<td>Spear with Spearthrower</td>
<td>1</td>
<td>0.11</td>
</tr>
<tr>
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<td>Spearthrower</td>
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<td>1.78</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>898</td>
<td><strong>100.00</strong></td>
</tr>
</tbody>
</table>

*Table 6.7 Count and frequency of material culture motifs*

This motif class is dominated by three distinct objects: spears, boomerangs and shields (Table 6.7), with the former dominating the Linear Schematised style, and the latter two motifs largely
falling into the Outline Figurative style. Each of these major classes will be explored in detail below.

Amongst material culture engravings, the motifs fall into two broad style groups, with few exceptions: Outline/Patterned Figurative, and Linear Schematised. Of the 539 outlined objects (including boomerangs, clubs, shields, and spearthrowers), 375 motifs include internal design patterning. There is some overlap between designs across material culture types (e.g. between boomerangs and shields), but it seems that each object possesses its own range of permissible designs. These designs are argued to contain the best potential for identity signalling from this group of motifs (Gamble 1982; McDonald 1999; McDonald and Harper 2016; C Smith 1992; Wobst 1977), and the combination of their form (Outline + Patterning) and technique (Pecked and Pecked/Abraded) with the use of repeated designs is presented as one stylistic group.

**Shields**

210 shield engravings from SWC4 and MK3 and an additional 20 shields recorded across other Marapikurrinya sites are included in this analysis.

![Example from the Upper Yule of a held shield in profile](from Wright 1968, Figure 538, no scale)

Shields are inferred to be publicly displayed objects (McDonald and Harper 2016) and as such have optimum capacity for projecting cultural identity information (Gamble 1982, Smith 1992, Wobst 1977). While physical shields are found, and have been collected, across Australia shield motifs are only found in limited rock art repertoires, and are more frequently indicated by association: i.e. represented by an arc with an anthropomorphic figure, held in such a way to suggest a shield rather than boomerang (see Figure 6.29). Marapikurrinya shield motifs are
rarely seen in other engraved Pilbara style provinces, demonstrating clear regionalisation within the Pilbara (McDonald and Veth 2013). Rich stylistic variability is found in these Marapikurrinya motifs - both in the shield morphologies and the designs on them.

Shields are strong contenders for intra-group social signalling, and the variability found at Marapikurrinya may also suggest something about inter-group signalling. All of the Marapikurrinya shield motifs are found only on the coastal strip and these engravings have not been identified elsewhere within the Kariyarra language bloc (except for one example in the Upper Yule region, near the eastern boundary of Kariyarra country).

**Design Variability**

Of material culture with internal designs, shields are the most common, and the design variability is the most complex. In recorded material culture, design variability on shields across the Pilbara is limited to zigzag patterns, where the number of bends in the zigzag is tied to particular territories:

- 3 bends: *Pangkurda* – Ngarluma, Indjibarndi and Martuthunira/ Fortescue Alliance;
- 4 bends: *Kagurrga* (also a name for the Yule River) – Kariyarra;

McCarthy (1962) identified 86 shields from five sites and defined five design categories:

- Striped Interior Designs (n=5);
- Barred and Striped Interior Designs (n=2);
- Gridded Interior Designs (n=14);
- Curvilinear Interior Designs (n=64); and
- Composite Interior Design (n=1).

However, these design types were not found to be useful, and a new classification was devised. Across five Marapikurrinya sites 230 shields were identified, and from these 23 design variations from eight design groups were identified (Figure 6.30). Designs found on shield motifs are divided into eight groups based on design type:

A. Curvilinear;
B. Zigzag;
C. Asymmetric;
D. Wavy;
E. Linear;
F. Empty Space;
G. Blank; and
H. Concentric.

Within these types, between one and six design variations were recorded (see Figure 6.30).

Figure 6.30 Shield Typology (from McDonald and Harper 2016: Figure 131)
Figure 6.31 Shield Design counts by Design Group

Figure 6.32 Stacked column graph showing design count and site locations
The most common designs are A2 (Curvilinear) and E1 (Wavy) (see Figures 6.31 and 6.32), with 25 occurrences each: A2 at all sites and E1 at 4 sites (not SWC5). The majority of shields were recorded at SWC4 (N=106) and MK3 (N=105), with less than ten shield motifs each for the remaining sites (2 Mile, N=8; SWC5, N=4; Burgess Point, N=3; SWC3, N=3). The sample sizes across SWC4 and MK3 provides a robust dataset for intra-site comparison.

The shield motifs can be summarised as follows:

- A total of 23 shield designs are identified, with an additional group ('X') for unidentifiable designs;
- Unidentifiable examples ('X') account for 11% of the assemblage (i.e. these are not blank shields ('G1'), but either too incomplete or weathered to be identified);
- Curvilinear type A2 and Wavy type E1 are the most frequent designs;
- Sinuous type D5 is the second most frequent design, accounting for 10% of the assemblage;
- Undecorated or blank shields, type G1, account for 6% of the assemblage;
- Five of the designs are unique (i.e. there is only a single example within the assemblage);
- Fifteen designs account for c.82% of the assemblage, while nine designs account for c.65% of the shields;
- Of the two designs seen in the WAM shields collected in Marapikurrinya one is rare (C1: N=7.3%) and one is very common (E1: N=25 in the engraved assemblage);
- Zigzag designs (B1, B2 and B3) associated ethnographically with defined Pilbara language groups occur in low frequencies in the engraved repertoire;
- Design A1 was identified ethnographically as a Kariyarra shield (von Brandenstein 1972); and
- Sinuous designs in the engraved shields are more often superimposed by subsequent motifs (i.e. older) while Curvilinear designs are rarely superimposed (i.e. more likely to be recent designs).

McDonald and Harper’s (2016) research compared this dataset with a similar number of shield motif engravings from the Sydney-Hawkesbury style region, and found that the Sydney design variability was more homogeneous than found in the Marapikurrinya assemblage.

The designs on Marapikurrinya shield motifs appear to represent conscious group signalling of territorial affiliation to a focalised abundant coastal resource. This territorial signalling includes both intra-group variability at an individual or clan level; as well as broader language group
affiliation as shown by variation within design types. The presence of multiple of von Brandenstein’s (1972) language group designs (B1, B2 and B3) may indicate that Marapikurrinya is an aggregation locale (Conkey 1979, see Harper 2017 in press). However, examination of weathering and superimposition (see Chapter 7 for more) suggests that there is also chronological cultural succession between design types.

**Boomerangs**

There are 143 boomerangs recorded across SWC4 and MK3. These motifs were divided into a total of 22 individual designs based on six larger design groups (i.e. B-A – B-F: Figure 6.33), with between three and five variations identified (e.g. B-A1, B-A2, B-A3).

![Boomerang design variability by design group](image)

**Figure 6.33** Boomerang design variability by design group

One design (B-B3) dominates the boomerang designs, with 80 recorded examples (Figure 6.34). Combined with B-B1 (n=12) and B-B2 (n=6), this horizontal linear group comprises 68.5% of the entire boomerang assemblage. Of the remaining designs, none have more than ten examples, and there are eight unique designs (i.e. one example only) recorded. This variability similarly suggests less cultural conformity and large group identity being signalled through boomerang designs.

The boomerang designs and shield designs share a common visual language with the sinuous (D) types across both assemblages.
Figure 6.34 Boomerang motifs by style (coloured by style group)

Spearthrowers

Sixteen spearthrowers were recorded with internal designs, and of these fourteen (almost) unique designs were recorded (see Figure 6.35). Unlike shields and boomerangs, there was no dominant design. Longitudinal banding in various compositions is the most common design, akin to some shields (E designs), and boomerangs (C designs).

A morphological difference distinguishes this group into two types (A and B), separating long, thin objects from squat, rounded objects. Von Brandenstein’s (1972) work suggests that some of these long thin (A category motifs) may be wooden ‘swords’. A variety of handles and hooks are evidenced in these motifs.

Physical spear throwers described by McCarthy (1958) and von Brandenstein (1972) suggest that (like the shields) we should expect to see zigzag designs marked on spear thrower engraving. However, this is not the case.
Summary of Material Culture Designs

Designs vary between shields, boomerangs and spearthrowers, with the largest sample and greatest variability seen on shield motifs (see Harper 2017). Across the three motif types there is some design consistency, with wavy designs recorded across each (D group on shields and boomerangs, and S-A6 and S-B2), and longitudinal banding (E group on shields, C group on boomerangs, and various spearthrowers: S-A1, S-A2, S-A3, S-A4, S-A5, S-A7, S-A8, and S-B1). The ethnographically recorded zigzag designs are notably rare across the three motif types, with a few exceptions on shields (B designs). Superimposition analysis of these design groups will be explored further in Chapter 7, to assess whether there is temporal change for design preference.

Spears

There are 320 spear motifs recorded, 97 from MK3, and 223 from SWC4. The majority of these spear motifs are linear shafts and barbs (n=284, f=88.75%), with a handful of infill shafts with linear barbs (n=36), fitting within the Linear Schematised style. Spear motif length ranged from
five to 310 centimetres in length, and there was no positive correlation between form and length i.e. a range of lengths was observed for linear and infill motifs. Approximately one-third (N=103, f=32.2%) of spear motifs are involved in superimpositions, and discussion of this in terms of composition, scene and sequence will be discussed in Chapter 7.

Figure 6.36 Extract from Clement (1903: Figures 1-4)

Figure 6.37 ‘Talamara’ or spears (redrawn from Tindale 1987: 48) and engraved circular barb spear (motif 25-035c)
In terms of variability across this motif class, the major points of difference are around barb organisation, with length, angle and direction all playing a role. Barbs were recorded as short diagonal dashes, on one or both sides of the shaft, closed spaced, widely spaced, with a few barbs marked at the top or centre of the shaft, or alternately along the length of the shaft. Other barb patterns include crossed or multi-directional barbs (see Figure 6.36), and there are two examples of the circular barbed spears recorded by Tindale (see Figure 6.37). Some spears included forked tangs at one end, suggesting use with a spear thrower.

Three spears were recorded with what appeared to be rope at one end, which could represent fishing spears. These are different technology to the fishing spears described by Tindale used in combination with nets:

Several kinds of spears were used in fishing, both in the Yule River and in the tidal estuaries. These constantly active tidal streams carried deep water inland because of the high tidal range, and the spearing of dugong or njamina gave them their most favoured source of meat. Taking advantage of these tides, men armed with extra-long pole-like spears watched the water as it flowed up an inlet. They tested the water by throwing leaves onto it. When the inflow ceased at highest tide they set nets, called 'parubaru', bracing them with poles while men armed with barbed spears awaited the chance of spearing an entrapped animal (Tindale 1987: 47).

These motifs fit with Kundjing's (Kariyarra man) description about a harpoon like Kariyarra spear wadjir (see Figure 6.38), with a knob at the butt end to secure a rope made of human hair, with the other end tied around the fisherman's waist (Tindale 1987: 56).

Figure 6.38 Wadjir spear (sketch by Kundjing, redrawn, from Tindale 1987: 56)

Fishing 'scenes' where marine motifs are speared or entangled with ropes will also be discussed in Chapter 7, enhancing the maritime technologies observed in the rock art here.

Other Unique/Rare Motifs

Fishing Net Needle

One motif may represent a gnalla or fishing net needle as morphologically similar to one recorded by Clement (1903) along the Pilbara coast (Figure 6.39).
A small number of motifs were classed as different kinds of fibre technology including bags (n=8; see Figure 6.40), nets (n=3; see Figure 6.41), rope (see Figure 6.42) and shoes (n=15). These provide information about material culture that is less likely to survive through time in an archaeological context, both because of the material type and as functionally these are objects that are worn out, rather than curated like shields.

Figure 6.39 Gnalla or fishing net motif (motif 09s-021a)

Figure 6.40 Possible bag motif 19-010
There are 15 shoes recorded, 11 from SWC4 and four from MK3. A series of seven individual shoes can be seen traversing across the highpoint of the major ridge on SWC4 for more than 100 metres. As shown in Figure 6.43, within this small motif class there is rich diversity, including shoe motifs very like those seen on the Burrup Peninsula (Mulvaney 2010). These shoes fit within the Outline/Patterned Figurative, with various internal patterning most likely representing the technology (arrangement of fibres) of the shoe. Toes are represented both
inside and outside of the ‘shoe’, and different weaving patterns are shown. These shoes may be *kadaitcha* shoes (Davidson 1947), or rush sandals (Akerman 2005; Smith 1966; WAM: as collected by Alfred Canning in the Western Desert).

**Figure 6.43** Range of shoe motifs

There is one example of superimposition (see Figure 6.44) which shows a weathered shoe superimposed by a stingray motif. This overprinting will be discussed in Chapter 7.

**Figure 6.44** Stingray over shoe motif
**ZOOMORPHIC MOTIFS**

Zoomorphs comprise a variety of animals identifiable to general marine, avian and terrestrial set of categories. Several animals are identifiable to a more specific level: crabs, dolphins, frogs, insects, jellyfish, (probable stingray) livers, lizards, seals, sharks, shellfish, snakes, squids, stingrays, turtles and whales (see Figure 6.45; Appendix 4 for definitions). The animal motifs are dominated by marine species, with macropods and emus notably absent: despite being common across other Pilbara provinces, and in evidence in the track repertoire.

Turtles and stingrays dominate the identified zoomorphic assemblage (Figure 6.45), followed by snakes, fish and an array of marine fauna. Island MK3 has a higher incidence of zoomorphic motifs (n=306, 8.9%) compared with SWC4 (n=285 5.7%).

Multiple styles are seen across the animal depictions, with the key factor in distinguishing these styles being their form. Most animals are marine species, and most these depictions are Outline/Patterned Figurative, and seen ‘from above’ as shown by the presence of two eyes (Rosenfeld 1988).

![Figure 6.45 Marapikurrinya Zoomorphic motifs](image)
There is a smaller suite of infilled zoomorphs, across a restricted range of species which fit within the Infill Naturalistic style. Lizards (of which there are no outline examples) are all solid infill, apart from one whose form is infill but made of unjoined but closely pecked individual dots. There are also crabs, one frog, three unidentified marine species (most likely crustaceans), two stingrays, two jellyfish and four fish. Interestingly, this style includes both marine and terrestrial fauna. One unique turtle has an infilled head and flippers, attached to an outline and banded shell, showing the combination of forms seen in some Minyiburu.

The Outline/Patterned Figurative style is heavily dominated by stingrays and turtles, both of which have minor stylistic variation (and sub-styles), followed by various fish and other finned marine species such as probable whales, sharks, dolphin and seals. A small group which forms a distinctive subtype is banded outline marine animals, and these tend to be non-diagnostic marine species.

**Terrestrial**

Terrestrial motifs are dominated by snakes, some lizards, and a single unidentified quadruped motif. Most terrestrial motifs fit into the Infill Naturalistic style, with some Linear Schematised figures.

**Snakes**

Snakes form the largest group of terrestrial motifs with 49 motifs recorded: 25 from MK3 and 24 from SWC4. This motif class has moderate stylistic heterogeneity for a small collection of motifs, and includes a few different forms including simple linear motifs (e.g. 6.46), infill motifs, and outline and patterned motifs.

The most common form across snakes are infill (n=41) snakes, of varying lengths. There are fewer outline snakes (n=8), six of these are banded, one has a dot infill, and one an internal parallel line. There is some similarity between these banded snakes, and banded boomerangs (discussed below). However, the distinctiveness of the two motifs’ morphologies is sufficient to classify motifs into either category. What this may suggest however is a design connection between snakes and boomerangs, suggested by the similar graphic vocabulary, possibly through joint narratives. Patterning on snakes also includes one example of a longitudinal stripe, and dot infill. Whether any of these patterns reflect species identification is unclear, but banded possibilities include banded western brown, Pilbara death adder, Pilbara bandy bandy, black headed python or Woma (Bush and Maryan 2004)
The length range across snakes is from 10 to 366 centimetres, with ten snakes longer than 1 metre.

A common feature ($f=32.7\%$) is snakes emerging from or entering into the vughs on the rock surface: interacting with these empty spaces. This is seen across meandering infill forms, with four snakes entering/exiting multiple vughs (see Figure 6.46), and may also refer to narrative associations with these specific motifs (as with Minyiburu, Murra Murra and turtle motifs).

**The Quadruped**

A single quadruped was recorded, and is indeterminate as to species (see Figure 6.47). It has no head, the body is roughly semi-circular, and it has four thin legs which end in cloven, or two- and three-toed feet. This may represent a stylised frog, an echidna, or something else entirely. A roughly pecked outline arc (potential boomerang) is engraved directly above this figure.
Lizards

Fourteen stylistically homogeneous lizards were recorded. Thirteen of the lizards are solid infilled, with variations in body thickness, leg direction, tail thickness and tail length (Figure 6.48). Infill forms are relatively uncommon across the Zoomorphs, and the Figurative classes generally. Infill forms are much more common, however, within the track repertoire.
Marine

Marine fauna dominates the figurative animal motifs. The two most common marine motifs are turtles and stingrays, the former being a relatively stylistically homogeneous group within the Outline Figurative style, and the latter presenting greater heterogeneity, with examples fitting within Outline Figurative and Infill Mixed styles. This group also includes a variety of non-diagnostic marine fauna, with some identifiable species such as whale, shark and seal. The great majority of these motifs are outline in form, and variation to this pattern is discussed.

Turtles

126 turtle motifs (including carapaces without heads/flippers) were recorded, with 77 of these motifs on SWC4, and 49 on MK3. The turtle motifs form a relatively homogeneous set. To classify stylistic diversity across this group, the following variables were recorded (see de Koning 2014; Gunn and Mulvaney 2008):

- Carapace shape: oval, pointed, linear (see Figure 6.53) and asymmetric;
- Carapace pattern: see Figure 6.49;
- Head: presence, form;
- Flippers: presence (front and back), form, dot infill;
- Eyes: count; and
- Tail: presence and form.

![Figure 6.49 Classification of turtle carapace patterns](image_url)

Thirteen carapace patterns and four carapace shapes were identified from 120 diagnostic shells (the remaining six were indeterminate/weathered). Turtles present a relatively homogeneous
group. Two designs dominate, and seven of the thirteen designs have less than five examples (cf. Murujuga (the Dampier Archipelago) where there is extreme stylistic variability found in this motif: de Koning 2014).

Of the four carapace shapes, the most common is Oval (red, Figure 6.50), and with the exclusion of two unique carapace designs (A3 and H) this shape is recorded across all designs.

B2 and B1, the banded and bisected design group, dominate the assemblage (n=57, f=55.83). As these two designs are related – i.e. the distinction between the two is the relative spacing of horizontal bands – they may also represent a single design.

Twenty-one motifs represent just the turtle shell, with no head, flippers or tail. In two instances this may be a result of weathering; however the remaining 19 appear to be a deliberate choice. These have been identified as turtle shells based on carapace designs matching those recorded on complete turtle motifs.

![Carapace Design and Carapace Shape, sorted by frequency](image)

**Figure 6.50** Carapace Design and Carapace Shape, sorted by frequency

The combination of heads, flippers and tails are presented in Figure 6.51. Of these, 31 turtles have no flippers, with 1-6 flippers recorded across the remainder of the turtle motifs. 85 turtles have heads, and 65 turtles have tails. The most frequent depiction is anatomical i.e. four flippers, head and tail present. However, there is a great variety of choices being made around including all flippers, tail and head, but there appears to be a relationship between increasing number of flippers, and presence of a head.
Figure 6.51 Turtle design: relationship between number of flippers, and presence/absence of heads and tails

Form varies across the head, flippers, and tail, with outline as the most dominant form for all categories, and (with one unique linear exclusion, 10s-023b) all carapaces were outline. Consequently, most turtles fit within the Outline/Patterned Figurative style. Of the 85 turtles with heads: three turtles had vughs in place of heads, five turtles have infill heads, and 77 outline heads. Of those with outline heads, 54 had eyes, most commonly two (n=47), some with a single eye (n=4), three eyes (n=2), and one example of a three-headed turtle or turtle scene, with two eyes per head. Tails also tend to be outline (n=50), with equal numbers of infill and linear tails (n=7 each), and one combination Infill/Linear tail recorded. Flippers also tend to be outline (n=89), with low frequency of linear and infill flippers (n=3 each), and two unique forms: one infill and linear set, and one infill and outline set. The form of flippers, head and tail seem to be related (i.e. where one is outline, the others most commonly follow). Relationship to carapace pattern isn’t evident, for example three rare turtle motifs with infill head and flippers have two different carapace patterns represented (B1 and B2), as well as being the most common carapace patterns, as opposed to rare patterns limited to this head and flipper form.

Size varies from motifs that are 8 centimetres long, through to 190 centimetres long.

Turtles are more likely to be in a superposition relationship on SWC4 (61.6%), and more likely to be a freestanding engraving on MK3 (65.3%). Across carapace design groups (where more
than one motif is found), superimposition is consistently present for at least half of the motifs, and higher frequency for A1 motifs.

One repeated feature found on turtle motifs is the presence of either an infill circle in one or multiple flippers, or the presence of a small vugh inside the flipper outline. There are twelve turtles with these dots across five carapace design types where this pattern is repeated: B2, B1, A1, F and C2 (Figure 6.52); four of these use the vughs for this.

Five turtle motifs were unique, and do not confirm to the broader stylistic conventions (see Figure 6.53). These outliers provide some insights into the stylistic variability, in an otherwise highly homogeneous group, within the Outline Figurative style.

![Figure 6.52 Carapace Design types which incorporate circles/vughs inside the flippers](image)

![Figure 6.53 The five unique turtles](image)
**Stingrays**

There were 107 stingrays recorded (105 individually, 2 as a pair), with near equal frequencies across the two islands: 57 motifs at MK3, and 50 motifs at SWC4. The following variables were used to explore stylistic variability:

- Body shape: see Figure 6.54, Table 6.8;
- Form: dots, outline, infill;
- Liver: presence; shape: see Figure 6.55;
- Tail: presence; shape: line, lines, circle, triangular;
- Flaps: presence; shape: oval, semicircle, line, bisected arc; and
- Patterning: dots, banding, vugh.

Body shape is described by 13 different shapes (Figure 6.54):

- O: Oval;
- C: Circle;
- SC: Semi-Circle;
- ST: Semi-Circle Triangle;
- CT: Curved Triangle;
- T: Triangle;
- B: Balloon;
- RR: Rounded Rectangle;
- I: Irregular;
- CD: Circular Divet;
- RT: Round Tail;

![Stingray Body Shapes](image)
• PT: Pointed Tail; and
• N: Naturalistic.

The most common body shape recorded was circular (21.5%), followed by oval (20.6%), irregular (16.8%) and balloon (13.1%). These four categories comprise c.71% of the assemblage, with the other nine shapes representing minor components, or unique example (see Table 6.8).

Three forms were recorded for stingray motifs: Outline forms predominate (n=101, \(f=93.5\%\)), with a few dot forms (n=5, \(f=4.7\%\)), and even fewer infill forms (n=2, \(f=1.8\%\)). There is consistency in the overall form of dot stingrays, with either circular or oval body forms, linear tails, and no other features, and these motifs fall outside of the three key stylistic groups. The two infill motifs have distinctly different body shapes (one is balloon, one is rounded triangle). The outline forms demonstrate significant variation of body shape, patterning, tail presence and form, liver presence and form, flaps presence and form, and presence of eyes and nose/beaks, no doubt a result of the larger sample size, but remaining within the Outline/Patterned Figurative style. The two infill examples fit within the Infill Naturalistic style. The dot infill stingrays appear to be a continuum of the Outline/Patterned style, but a unique development only seen in stingray motifs.

<table>
<thead>
<tr>
<th>Body Shape</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>23</td>
</tr>
<tr>
<td>O</td>
<td>22</td>
</tr>
<tr>
<td>I</td>
<td>18</td>
</tr>
<tr>
<td>B</td>
<td>14</td>
</tr>
<tr>
<td>CT</td>
<td>7</td>
</tr>
<tr>
<td>N</td>
<td>7</td>
</tr>
<tr>
<td>RT</td>
<td>5</td>
</tr>
<tr>
<td>SC</td>
<td>4</td>
</tr>
<tr>
<td>RR</td>
<td>2</td>
</tr>
<tr>
<td>ST</td>
<td>2</td>
</tr>
<tr>
<td>CD</td>
<td>1</td>
</tr>
<tr>
<td>PT</td>
<td>1</td>
</tr>
<tr>
<td>T</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>107</strong></td>
</tr>
</tbody>
</table>

Table 6.8 Stingray body shapes
Interior patterning was common (n=58, f= 59.7%). The most frequent body patterning recorded was dot infill (see Table 6.9). Other patterning includes vughs recorded inside bodies: and there are four unique examples which have either combined dot and spine line, a semicircular face division, or an internal vertical line. Dot infill patterning is a distinct stylistic choice made for Marapikurrinya stingrays (and a few squid, see below). This patterning may be a species attribute. The Bluespotted Fantail Ray (Taeniura lymani) or Bluespotted Maskray (Neotrygon kuhlii) are both local Marapikurrinya species (Atlas of Living Australia 2016).

Fifteen stingrays have shapes that have been identified as livers inside their bodies (Figure 6.55). Stingray livers can form up to 25% of their internal organs, and is a noted food source, due to their fatty composition (e.g. Tindale 1987). Their livers have two prongs, visually like heart (H), crescent (CR) and double oval (DO), and possibly triangle (T), as a schematised representation of livers. Circle and Oval are less visually connected to this shape; however their placement within the body cavity suggests they could be livers or some other body parts.

<table>
<thead>
<tr>
<th>Pattern</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dots</td>
<td>50</td>
</tr>
<tr>
<td>Vugh</td>
<td>4</td>
</tr>
<tr>
<td>Banding</td>
<td>1</td>
</tr>
<tr>
<td>Spine/Dot</td>
<td>1</td>
</tr>
<tr>
<td>Face</td>
<td>1</td>
</tr>
<tr>
<td>Line</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>58</strong></td>
</tr>
</tbody>
</table>

*Table 6.9 Stingray Patterning*

Two of these shapes (H and DO), were recorded as 84 free-standing livers within the assemblage. These motifs were not found in association with rays, or other marine motifs. Their association here within the bodies of the rays, provides strength to the argument that these
shapes are representing livers, when seen as isolated motifs. When not associated with rays, DO – for example – could be interpreted as a shell. Elsewhere in the Pilbara, such as Murujuga, these motifs have been identified as shark’s livers (Vinnicombe 1987, 2002; see also Campbell 1911).

A number of shapes were seen at the base of the body/start of the stingrays’ tail, and were labelled ‘flaps’. Stingray anatomy suggests that these are pelvic fins and claspers (Last 2016). Many ray species have pectoral fins at the base of the body that are a semi-circular shape. Located under the tail, these match the bisected arc category of flaps recorded in the art. Male rays also have claspers, which are used in reproduction. This diagnostic feature matches up with oval, semi-circle, and linear categories of flaps recorded. If these are claspers (as opposed to pectoral fins) stingray gender can be inferred for c. 20 % of the engraved rays: which would be male.

**Other Marine Motifs**

Fish, sharks, dolphins, seals, whales and other marine motifs have been grouped together given their generally lower numbers and because their identification to species level is difficult. The presence of fins and tails marks these motifs as marine animals. Beyond that, inferences are being made around size, proportion and shape of various features. Amongst the fish, specific morphologies also suggest specific species are being depicted.

Style plays a role here also. Whilst most of these motifs fall within the Outline/Patterned Figurative style, within this group some of these motifs are more naturalistic, with anatomical detail present, whilst others are more stylised. These different ways of presenting marine animals are discussed further.

The following variables were used to explore stylistic variability:

- **Eyes**: count;
- **Tail**: shape (see Figure 6.56); form: infill, linear, outline (bodyline), outline (attached);
- **View**: above, profile, multiple;
- **Patterning**: dots, banding, striped, other; and
- **Fins**: number; form: infill, linear, outline (bodyline), outline (attached).
Of the 97 marine motifs summarised here, four motifs are infilled (Infill Naturalistic style), and 93 are outlined with and without interior patterning (Outline/Patterned Figurative) (Table 6.5). Two of the four infilled marine motifs are unique (see Figure 6.57), although are similar in shape and flipper/tail form to other outline figures.

**Figure 6.56** Assorted Marine Motifs Tail Shapes

**Figure 6.57** Infilled 'Marine' motifs, both highly weathered (13-009a and 245-037a)
The outlined figures vary from stylised through to naturalistic and have been grouped into subtypes accordingly (see Figure 6.58). Several unique motifs exist outside of this classification, but these are not recognised as evidence of a style.

**Figure 6.58** Range of sub-styles seen in marine motifs

- M1: stylised outline bodies, asymmetric and symmetric examples, including tails as part of the outline, flippers where present are outline, either as part of the body line, or attached;
- M2: same as M1, but banded;
- M3: symmetrical and more naturalistic outline body forms;
- M4: outline body with forked infill or linear tails, some linear flippers;
- M5: naturalistic, profile outline category, more anatomical detail included;
- MS1: outline catfish; and
- MS2: outline marine fauna, unspeciated.

M1 forms are the most frequent (n=40, f=41.23%), followed by M3 (n=17, f=17.52%) and M4 (n=12, f=12.37%). The remaining style groups have fewer than 10 examples each (see Table 6.10).

There are a handful of examples which include sufficient detail to suggest specific species are being depicted (e.g. M5 category). These are seen across sub-style groups within the Outline/Patterned Figurative style where examples of stylised and more naturalistic whales are illustrated (see Figure 6.59).
Table 6.10 Count of Marine Styles, sorted by decreasing frequency

<table>
<thead>
<tr>
<th>Style</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>M1</td>
<td>41</td>
</tr>
<tr>
<td>M3</td>
<td>17</td>
</tr>
<tr>
<td>M4</td>
<td>12</td>
</tr>
<tr>
<td>M5</td>
<td>9</td>
</tr>
<tr>
<td>MS2</td>
<td>5</td>
</tr>
<tr>
<td>INFILL</td>
<td>4</td>
</tr>
<tr>
<td>M2</td>
<td>4</td>
</tr>
<tr>
<td>MS1</td>
<td>4</td>
</tr>
<tr>
<td>MX</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>97</td>
</tr>
</tbody>
</table>

The less anatomical sub-styles (e.g. M1) dominate this group, meaning that identification to species level by etic observers (i.e. individuals outside of the social group) is difficult.

The assertion that Marapikurrinya art is seen from above (Rosenfeld 1981) is explored further. Seventy of these motifs have eyes, which allows for inferring whether the view is from above, in profile, or a mixture of views (Figure 6.26). The most common view across Marapikurrinya is from above (75.7%), followed by profile views (21.4%), and a small sample with multiple perspectives (2.9%).

Figure 6.59 Examples of stylised and naturalistic marine fauna at species level: 255-018a; 115-042a
Across the different sub-styles there is some variation. In the largest group (M1) the plan view dominates (88.8%). Above views are also both present and dominant for all styles excluding M5. Interestingly though, M3 shows a different ratio between above and profile views to the pattern seen across the larger sub-style groups (Figure 6.60).

![Bar chart showing the distribution of Above, Multi, and Profile views across different sub-styles.](image)

**Figure 6.60** View of Outline/Patterned Figurative Marine Motifs

**Squid**

Four squid were recorded, two on each island. Each of the squid has outline irregular oval bodies, two with dot infill, fitting within the Outline/Patterned Figurative style. The two patterned squids had similar tentacles, represented by parallel meandering lines (see Figure 6.61), whilst the other two had multiple linear legs, slightly curved.
Figure 6.61 Squid motif (#09s-006a) shown with material culture – probable fishing spear

**Jellyfish**

Six jellyfish were recorded, three on each island. Four had outline bodies (three are semicircular, one is irregular), two with infill bodies (one semicircular, and one oval shaped), suggesting sequential engraving of these figures, in the Outline/Patterned Figurative and Infill Naturalistic styles. All possess multiple parallel linear tendrils, varying from straight to curved.

**Crabs and Crustaceans**

Five crabs were recorded: four on MK3, and one on SWC4. All are infill, with distinct fresh looking ‘chunky’ peck marks and homogenous characteristics, fitting within the Infill Naturalistic style. Their bodies are all oval, with a varying number of legs (six to eight, plus pincers: i.e. some are anatomically incorrect, as crabs have ten legs). Distinct pincers are represented on four of the motifs. Three unique motifs, most likely also crustaceans of some variety, utilise the same technique and form (see Figure 6.62).

These figures have low weathering condition. Whilst a small group, it seems these diverge from the dominant outline and patterned styles seen amongst other marine fauna such as turtles, stingrays, and various fish motifs.
Avifauna

Four birds were recorded and three of these are unique and not standardised in form. One example has bird legs emerging from an egg or oval shaped body, an outline bird with outstretched wings as if flying and seen from above, and the third a set of bird's legs emerging from a vugh which may represent the body. The single naturalistic motif was classified as a bush turkey (see Figure 6.63). This is a unique engraving, shown in profile, as opposed to from above, with fine dot infill in the body, which has broad similarities to dot infill across the stingrays.

Figure 6.62 Crab and related crustacean motifs (305-023c, 11-012a, 315-020g and 20-007d)

Figure 6.63 Motif #775-001, Bush Turkey
This motif is small compared with other animal figures (measuring 70 x 38 centimetres) and isolated. It is associated with a vugh, and appears to have been modified through time – with an additional tail area at its rear added to the original outline. Whilst outline in form, this naturalistic and in-profile bird does not fit within the Outline/Patterned Figurative style characteristic of Marapikurrinya.

**SUMMARY OF FIGURATIVE MOTIFS**

Outline/Patterned Figurative is the dominant style identified across the figurative motifs. Included in these outline motifs are many marine themes including fishing technology amongst the material culture engravings, and a dominance of marine fauna. Of the two most common animal motifs – turtles and stingrays – the former is a highly homogeneous group, whilst the latter is heterogeneous: including Outline/Patterned Figurative and Infill Naturalistic styles, and a few unique styles only seen amongst this motif type (i.e. dot infill). The anthropomorphic motifs are highly heterogeneous, and dominated by two distinct types, the Minyiburru and Murra Murra, neither of which fits neatly within a style group, but form sub-types within the Outline/Patterned Figurative style. The stick figures, which fall within the Linear Schematised style, are highly variable with several large figures. The outline material culture discussed here is frequently decorated and with patterns uncommon across other outline motifs.

As a group, there are connections across these motif classes through inclusion within the Outline/Patterned Figurative style, in addition to variation within types specific to each, such as the pattern designs on material culture, or the repetition of stylistically unique anthropomorphs, that are argued to be culture heroes. The larger proportion of rock art recorded across SWC4 and MK3 comprises geometric and track motifs, which together make up approximately 78% of all engravings. This extensive engraved corpus will now be discussed.

**‘ARID-ZONE’ GEOMETRIC AND TRACK REPERTOIRE**

The majority of engravings across both SWC4 and MK3 are geometric (n=3956, f=47.54%) and track (n=2569, f=30.87%) motifs, together comprising approximately 78% of all Marapikurrinya motifs. Within these repertoires, there is significant variation in style. There are examples of track and geometric motifs across all broad form categories (i.e. outline, linear and infill) as recognised by McCarthy (1962), however they occur more frequently across Linear Schematised and Outline/Patterned Figurative styles.

Track and geometric motifs are analysed here to explore the patterning inherent in these. While marine species dominate the figurative motifs, within the track repertoire macropod and bird tracks dominate. Tracks by definition may exclude most marine motifs (which leave no trace on
the land), but species like turtles do have tracks represented elsewhere in rock art (Gunn and Mulvaney 2008; Mulvaney 2010; and see de Koning 2014).

![Figure 6.64 Count of tracks by species (descending order)](image)

Terrestrial fauna and humans dominate the track repertoire (see Figure 6.64). A handful of turtle tracks are recorded. Bird tracks here are classified as both avi- and terrestrial fauna because of the large number of inferred emu tracks recorded within this class (as defined further below, and in Appendix 4).

The number of human tracks (both hand- and footprints) is significant (n=839; f=32.7%): there are approximately four times as many human tracks as figurative anthropomorphs. Of these, approximately twice as many were recorded on SWC4 (N=580, f=70.3%) than on MK3 (n=259; f=29.7%), however this is not statistically significant (p=0.07). Across both islands most of these tracks are human feet (n=802).

Variation amongst human tracks was noted by Tindale (1987) who hypothesised that this variation recorded individual identity, through gait and toe placement.

Individual footprints range in size from 86cm to 4cm long. Of these, the majority are infill form including the toes (n=766, f=95.5%), a small number are infilled feet with linear toes (n=12, f=1.5%) or outline toes (n=9, f=1.1%, and a small number of feet are outline in form n=15, f=1.9%). There is no positive correlation between form and size i.e. all outline motifs are less than 40 centimetres in length, with the largest motifs all being infill. Looking at form as a time-
cost benefit analysis, outline motifs are more efficient (take less time) to execute, so this pattern of large infill tracks suggests a clear stylistic choice.

**ANIMAL TRACKS**

Non-human animal tracks recorded are shown (Figure 6.65 and 6.66) and include bird, macropod, dingo, insect, lizard and turtle tracks. These track types will each be discussed here.

![Track classification diagram]

**Figure 6.65** Track classification across South West Creek 4 and Mourambine Kariyarra 3 (M series are always found in symmetrical pairs; B series (excluding B1) occur individually)
Figure 6.66 Track counts by style, ordered by species (Bird = blue; Dingo = dark blue; Insect = plum; Lizard = orange; Macropod = red; Sitting Macropod = dark red; Turtle = light blue), in decreasing frequency.
Lizard

Two styles of lizard track were identified (L1 and L2, Figure 6.65). L1 has 10 examples (9 from SWC4, 1 from MK3), ranging in length from 6 to 52cm, and L2 has 15 examples (9 from SWC4, 7 from MK3), ranging in length from 12 to 112cm. One track interacts with a vugh in the rock surface. Superimposition is uncommon (n=4, f=16%). Lizards are represented in both the track and figurative repertoires. As is found with humans, lizard tracks (n=25) out-number the figurative representations.

Turtle

A small number of turtle tracks (n=5) were recorded relative to figurative motifs (n=110). Two styles of turtle track were identified: T1 (n=4; identification following Mulvaney 2010) and T2 (n=1; identification based on association with a figurative turtle motif). Four of these tracks were recorded on SWC4: one (T1) track was recorded on MK3. This reversal of figurative/track depictions is considered significant given the dominance of turtles within the figurative fauna, as the second most frequent motif by count, as well as the size and visibility of turtle engravings. In contrast with nesting locations across Murujuga, perhaps the absence of turtle nesting locations around Marapikurrinya's estuaries means that these are not tracked the same way that they are to the south, or that turtle eggs were not as prized here as elsewhere.

Insect

There are 83 insect tracks recorded (most likely centipede), equally distributed across the two islands (43 from SWC4, and 40 from MK3). This motif is a central line, often meandering, with small dots along either side. The length of these motifs ranges significantly from 13 through to 215 centimetres. This track type is often associated with vughs, with 27 (f=32.5%) entering or exiting these spaces. It is uncertain whether insects are present within the figurative repertoire: for example, sandflies could be represented by dots or centipedes by lines.

Bird

Bird tracks are the most common track recorded after human tracks. A total of 803 bird tracks were recorded (500 across SWC4, and 303 across MK3). There is considerable diversity amongst the bird tracks (Figure 6.65). This may represent species diversity (e.g. passerine: non-passerine; see McDonald 1993 for macropod tracks). However, as indicated in Figure 6.65, there are a range of stylistic choices being made around the form and detail provided in bird tracks (as with macropod tracks), from linear stylised representations, through to infill tracks with anatomical detail. There are 29 bird track types recorded including infill, linear and outline
tracks. Variability in toe length, width, shape and angle is argued to reflect both stylistic choice, and species. Across bird tracks, four broad categories were devised.

- 2 toes: B1 – V-shape stylised bird track;
- 3 toes: B2-B12 – from stylised to naturalistic, with various morphologies from angular to rounded;
- 4 toes (anisodactyl): B13-B24 – three toes forward, one heel toe, from stylised to naturalistic, includes examples with toe nails; and
- Separate toes: B25-B28 – curved to pointed toes where individual pads are shown.

Within these broad toe-based groupings, various styles can be seen. For example, B20 appears to be a naturalistic emu track, which B14 may also represent as a stylised version.

Johnstone et al. (2013) identify 60 bird species for the Pilbara coast, tidal mudflats and beaches, and an additional nine mangal species, directly relevant to the study area, in addition to 79 coastal plain species. These numbers highlight the contemporary avian species richness across the Pilbara, with assumed richness continuing throughout the Holocene, subject to climatic variation. Bird species for Marapikurrinya include liminal species such as waders, whose tracks may fall under styles like B2.

From the 29 types, four have more than 50 examples (B3, B10, B14 and B17), and two have more than 100 (B13, B15) examples each. The most common tracks (B13 and B15) share some similarities, both being linear 4-toed tracks with near equal length between the central and outside toes. However, there is a distinct choice between the straight lines of B13, and the curved outside toes of B15.

Whilst many of these tracks may be identified as marine habitat birds, many of these tracks appear to represent emu, and provide an ongoing link to the terrestrial Pilbara. What is interesting about these probable emu tracks is that many are in the Infill Mixed style: the most recent phases of engraving at these sites (see Chapter 7).

Four figurative bird motifs were recorded: one bush turkey and three stylised birds. These provide little context for interpreting this track assemblage.

Macropod

There are 743 macropod tracks across the study area, 497 from SWC4 and 246 from MK3. Along with bird tracks, this animal dominates the track assemblage. As shown in Figure 6.67 macropods have fewer track types (n=12, M2 – M16) than birds. However, macropod tracks include a range (n=11) of track scenes including pentipedalling and hopping macropod tracks.
(MS1 – MS11), along with the representation of macropod front paws (M1) and macropod tails (MT). Consequently, there is a strong sense of visual narrative around many of these tracks, which will be explored further in Chapter 7. As with bird tracks, variability in toe length, number, shape, claw presence, and angles between toes are argued to reflect both stylistic choice and species (see McDonald 1993).

Within this group one track (M3, n=277, 37.3%) dominates (Figure 6.69) followed by M2 (n=102), M5 (n=92) and M8 (n=7). This indicates a much more homogeneous set than seen amongst bird tracks. Paired tracks without the fifth toe shown (i.e. M2 and M5) indicate that the macropod is hopping on hard ground, whilst the presence of a heavy fourth toe and hooked fifth toe (M8) fit within tracks left in sand (McDonald 1993, pers. comm. 2016). Further analysis of these motifs would no doubt allow for speciation into identifiable kangaroo and wallaby species. However, like with the bird tracks these tracks show both extreme stylistic differences (e.g. M16) through to naturalism and detail including toe nails (e.g. M15).

No figurative macropod motifs were recorded.

**GEOMETRICS**

There are 3954 geometric motifs, which comprise nearly half of all recorded motifs (f=47.1%). Of these, 2237 were recorded on SWC4 (45.65% of all motifs recorded on that island); and 1717 were recorded on MK3 (49.16% of all motifs on that island). The most common geometric motifs recorded include arcs, circles, dots, fringes, lines, ovals, and combinations of these. The largest geometric motif class is Simple-Non-Figurative (‘SNF’) (n=725, f=18.3%), a broad classification for combined simple shapes, such as a rayed line. In contrast, Complex-Non-Figuratives (‘CXNF’) combine multiple shapes, such as a line and circle (see Clegg 1987). As a classificatory system, geometric motifs were divided into three classes: Simple Linear, Simple Outline and Combined (see Chapter 5, Figure 5.3). Both SNF’s and CXNF’s fit within the Combined class here, as they include multiple shapes. Simple linear motifs include: arc, line, dot, spiral, zigzag, trident, ‘T’ and ‘Z’. Of these, arc, line, dot and zigzag motifs have additional variations on these base geometric shapes. For example, arc variations include angular, banded, bisected, closed, concentric, hooked, parallel, as well as plural options for each of these e.g. angular arcs, banded arcs etc.

Unique and interesting motifs will be briefly discussed here, before a summary of variability is provided. Whilst numerically dominant, this part of the repertoire was not focussed on, as the figurative and track components were utilised as richer vehicles for portraying group identity.
Fringes

The number and variety amongst fringe motifs provides a distinct and dominant geometric motif that is engraved in a variety of ways: square \( (n=233) \), curved \( (n=21) \), and with ‘handles’ \( (n=23) \) (Figure 6.67). Motif lengths range from 3.5 to 92 cm, with no obvious correlation between shape and size.

![Figure 6.67 Geometric fringe motif types](image)

These could represent a few things, such as pubic aprons made from string, made of kangaroo or possum fur, and worn by both men and women (McCarthy 1962; Tindale 1987). Petri and Schulz (1951) also referred to these motifs, particularly the curved ones, which they suggested may represent wind or hunting breaks where the lines are people sitting behind them.

Concentric Circles, Ovals and Spirals

A small number of concentric circles \( (n=29) \) (e.g. Figure 6.68), concentric ovals \( (n=5) \) and spirals were recorded here. As noted by Petri and Schulz (1951) these motifs, particularly concentric circles, are normally associated with desert art. These motifs were recorded on both SWC4 and MK3 in comparatively equal numbers. Concentric circles and ovals ranged in length from 13 to 43 centimetres, where spirals were recorded between 14 and 20 centimetres in length. There are six concentric circles and two spirals in superimpositions. Their presence within the Marapikurrinya repertoire confirms the arid-zone nature of the geometric component of this art body.
CXNF's

There are 38 Complex Non-Figurative motifs: 36 from SWC4 and 12 from MK3. These motifs form an eclectic group: while many may represent objects or events, without an informed understanding, they remain in this motif class. Several of these motifs comprise a series of joined lines and shapes that could be interpreted as maps (see 12s-010a, Figure 6.69).

The size range of geometric motifs is exceptionally variable (between 2cm and 460cm). More than half of the motifs are linear in form (n=2112, f=53.4%), with comparable numbers of outline (n=541, f=13.7%) and infill (n=651, f=16.5%) motifs. The remainder are combinations of these three broad form categories. The large geometric motifs fit within the broad array of large motifs recorded across Marapikurrinya, enabled by the large flat calcarenite canvases.
A very small number of grinding grooves (n=11) were recorded, as distinct from the larger suite of seed-grinding patches. These are like features described elsewhere as axe-grinding groove (see Figure 6.70), made by sharpening edge-ground usually basalt axes and /or hatchets (see Akerman 2014). Superimposition was seen in one of these smaller grooves (Figure 6.72, #25-020c), where whilst weathered, it appears that the groove is made over a faded human footprint engraving. Abraded grooves, as recorded elsewhere across Australia, and identified by McCarthy elsewhere in Marapikurrinya, were not recorded during this fieldwork. These grooves were probably the result of utilitarian grinding, rather than being formal ‘rock art’.

A single incised bird track motif using the same abrasion technique was recorded.
Figure 6.70 Abraded/Grinding grooves over weathered footprint motif

**ARID-ZONE TRACK AND GEOMETRIC SUMMARY**

The domination of the geometric suite amongst the Marapikurrinya assemblages requires further analysis. For this research, this motif class is used to assert the connections between Marapikurrinya and its place within the broader arid northwest. Within the track repertoire it is possible to see, through changing style (i.e. Linear Schematised and Infill Naturalistic tracks, in addition to persistent non-diachronic motifs such as M2-M5 macropod tracks) continual engagement and re-engagement with the arid zone through changing signalling.

**SPATIAL SEPARATION**

The spatial organisation of the Marapikurrinya engravings reveals further insights about this symbolic behaviour. Whilst SWC4 and MK3 are each site complexes, and part of the larger Marapikurrinya estuary system, they contain varying degrees of activity and engraving intensity across their respective ridgelines.

Both islands have been divided into areas of localised and or intensive activity, or sub-sites. These areas were delineated into distinct clusters of activity, based on the presence and absence of engravings. During fieldwork, due to the density of engravings encountered, a sampling
strategy was implemented to target a range of site sizes, from single motifs, through small,
medium and large sites. Due to this sampling strategy, some of the gaps along this main ridge
are an artefact of the sampling methodology. However, small and isolated sub-sites genuinely
reflect areas of lower intensity engraving: the absence may be in the medium to high density
range of engraving activity from the eastern end of SWC4 which were omitted due to time
constraints (survey indicated whilst engravings continue, the density observed at SWC4-01 –
see below – does not continue eastwards). These sub-sites were broken into different sized
activity areas: XS <10 motifs; S <20 motifs; M <100 motifs; L <100 motifs; and XL>1000 motifs
utilising GIS density mapping tools (see Table 6.12).

South West Creek 4

There are 20 areas of activity, or sub-sites, on SWC4 (#SWC4-01-SWC4-20: Figure 6.73, Table
6.11). Along the major ridge on this island (on the southern side), there are areas of near
continuous engraving across approximately 600 metres, resulting in two large subsites: SWC4-
01 and SWC4-03, separated by 85 metres. Across this island (see Figure 6.6, and 6.71), there is a
focal point for engraving activity associated with SWC4-01 and SWC4-03, with several smaller
areas of activity scattered across the island, associated with the ridgelines. These sub-sites are
indicated in Figures 6.71 and 6.72.
Figure 6.71 Sub-sites across South West Creek 4 (Purple circles: sub-sites; Orange crosses: motifs)
Figure 6.72 Sub-sites across Mourambine Kariyarra 3 (Purple circles: sub-sites; Orange crosses: motifs)
<table>
<thead>
<tr>
<th>Subsite</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>SWC4-01</td>
<td>2568</td>
</tr>
<tr>
<td>SWC4-02</td>
<td>4</td>
</tr>
<tr>
<td>SWC4-03</td>
<td>1474</td>
</tr>
<tr>
<td>SWC4-04</td>
<td>12</td>
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<td>SWC4-07</td>
<td>10</td>
</tr>
<tr>
<td>SWC4-08</td>
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<tr>
<td>SWC4-20</td>
<td>11</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>4897</strong></td>
</tr>
</tbody>
</table>

Table 6.11 Motif Counts by Sub-site on South West Creek 4

**MOURAMBINE KARIYARRA 3**

Twenty-two areas of engraving activity, or sub-sites, were recorded across MK3 (MK3-01-2: Figure 6.72, Table 6.12). Compared with SWC4, whilst there are areas of more intense engraving from the centre to the east along the main ridgeline, there is less variability between site sizes (also see Figure 6.7). This may be a result of the overall morphology of the island, with one central spine of a ridgeline at the east, breaking and splitting into two smaller ridges towards the west. At the western end of the island there is less available calcarenite for engraving, and the rock surfaces are smaller and less suitable, lacking elevation.
<table>
<thead>
<tr>
<th>Subsite</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>MK3-01</td>
<td>144</td>
</tr>
<tr>
<td>MK3-02</td>
<td>5</td>
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<td>MK3-03</td>
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</tr>
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</tr>
<tr>
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<tr>
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<td>123</td>
</tr>
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<td>4</td>
</tr>
<tr>
<td>MK3-22</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>3493</strong></td>
</tr>
</tbody>
</table>

Table 6.12 Count of motifs by Sub-site on Mourambine Kariyarra 3

These sub-sites/activity areas were again divided into the same size classes (XS ≥ 10; S = 10-19; M = 20-99; L = 100-999; XL ≤1000). There are 13 extra small sub-sites with less than 10 motifs, three of these with a single motif; six small sites with less than 20 motifs; nine medium sites with less than 100 motifs; and 11 large sites with less than 1000 motifs; and three extra-large sites with 1474, 1475 and 2568 motifs recorded (see Figure 6.72). Between SWC4 and MK3 a similar pattern is seen, with a small number of XL sites, large number of XS sites, and array of site sizes in between. MK3 has a more variable pattern of site size (Figure 6.73), with a higher proportion of its engravings in either XS or L concentrations, where on SWC4 there is
more consistency, with four sub-sites each within the S, M and L sizes, six XS sub-sites, and two XL.

Figure 6.73 Count by sub-site size and site

When looking at motif class and motif choice across sub-site almost all motif classes are present across each of the sub-site size groups (Figure 6.74). Therianthropic motifs were only recorded at Large and Extra Large sub-sites, with Phytomorphs recorded at Medium, Large and Extra Large sub-sites, following diversity predictions (Kintigh 1989). However, of the motif classes present within these sub-site size classes, varying frequencies suggest different patterns for motif choice.

Figure 6.74 Frequency of material class by Sub-Site Size across South West Creek 4 and Mourambine Kariyarra 3
An ANOVA analysis, correcting for Tukey significance, returned a significant relationship (p=0.0115) between motif choice and site size, particularly the increased frequency of tracks and geometrics at larger sites. So, at larger sites, the full suite of engravings is found, with a preference for track and geometric motif classes, over figurative class motifs. Motif choice will be presented here by sub-site size.

**EXTRA-SMALL SUB-SITES**

Extra small sites have higher frequencies of figurative motifs (anthropomorphic, material culture and zoomorphic motifs, see Figure 6.74). These figurative motifs include two isolated Minyiburu (SWC4-09 and SWC4-11), one unique infill human figure, an isolated arm (probable *Murra Murra*), four turtles, one stingray, one snake, three shields, three spears and one boomerang. Of the 11 track motifs recorded, 10 of these are human (8 feet, 1 hand, 1 sitting woman motif).

Of the sites with a single engraving two of these are isolated arcs, and one stingray.

**SMALL SUB-SITES**

Small sub-sites have anthropomorphic, geometric, material culture, track and zoomorphic motifs represented, and have the highest frequency of grinding patches (n=6). In contrast with extra small sites, figurative classes are less dominant, with track motifs increasing comparatively, and material culture and zoomorphic motifs in decreasing frequency as site size increases.

Figurative motifs included in this size group include four different anthropomorphs (composite, infill, *Murra Murra* and *Stick*), boomerangs, spears and a spear with associated spearthrower, bush turkey, livers, lizard and marine fauna.

Animal tracks increase significantly with a range of bird, macropod and insect tracks, with a smaller set of human hand and footprints.

Amongst the geometrics 12 subjects were identified, including a concentric circle, fringes, variety of lines and linear designs, and Simple Non-Figurative motifs.

Two types of grinding patches were identified, three linear patches – the axe-grinding variety – and three round ground seed-grinding surfaces. Five of these were found in one cluster (MK3-14) with a series of linear geometrics, and a marine fauna motif.
**Medium Sub-Sites**

Medium sub-sites have the addition of engravings from the phytomorphic class, and have a closer frequency to the total motif class distribution (Figure 6.76). Across most motif classes, the diversity of subjects increases.

Minyiburu and Murra Murra are both represented, as well as composite, infill, outline and stick figures; boomerangs, shields, spears and spearthrowers are identified; and a variety of marine fauna including a probable dolphin, marine fauna, stingrays, turtles, livers, and snakes.

There are 28 geometric subjects identified within these sites, including a Complex Non-Figurative, concentric circles, crosses, outline shapes (i.e. circles and ovals) in various combinations and fringes.

The track repertoire remains relatively small (n=96) compared with the geometric repertoire (n=186). While the human component is small (n=19), bird, insect, lizard, and macropod tracks are all present.

**Large Sub-Sites**

All motif classes were recorded at large sub-sites, with a frequency very similar to the average frequency – as to be expected by the numbers of engravings located within these sites. In comparison with medium sites geometric frequency is slightly higher, material culture has increased, and zoomorphic motifs have the most significant decrease.

Amongst large sites, all motif subjects apart from unique motifs, are found, including two therianthropes: a birdman, and a mermaid. All anthropomorph subjects are present, including Minyiburu (n=12), Murra Murra (n=7), composite, infill, outline and stick figures, with several body parts identified separately including arms, heads and vulvas.

Amongst geometrics 49 subjects were recorded, with an increased frequency of CXNF’s, continuation of concentric circles and presence of spirals.

Of the tracks, 171 are human and 393 from other animals including bird, macropod, dingo, insect, lizard and turtle, which covers all recorded animal tracks.

**Extra Large Sub-Sites**

There are three Extra-Large sites: two from South West Creek 4 that are within 80 metres of each other (SWC4-03, n=1474; SWC4-01, n=2568) and one on Mourambine Kariyarra 3 (MK3-
11, n=1475). Sites SWC4-01 and SWC4-03 could be grouped together as one intensive area, however have been separated by an area of lower density engraving.

All motif classes are identified within this site size and in comparison with large sub-sites there is a noticeable increase in track motif frequency, and small decrease in frequency of zoomorphs and anthropomorphs.

Additional motifs identified within these extra-large concentrations include: axes, baskets, spear and rope, and the quadruped. However, there are also motifs not found within this site size (approximately half of all motifs), including the frog, or hooked stick motifs found within the large sites. However, both examples are of very rare/unique motifs (frog: n=1; hooked stick: n=2).

**SITE SIZE SUMMARY**

The intensity of engraving across the SWC4 and MK3 islands makes it clear that where available rock is, people have made use of the surfaces as art locales. This is demonstrated by the majority of rock surfaces having at least low density or scattered engravings. Parts of the islands have resulted in extravagant engraving complexes, rich in motif diversity and superimposition, suggesting ongoing use of the same focal points along the ridgelines. There are minor differences between site sizes and what people are choosing to engrave as shown by relative frequencies of motif class choice. Smaller sites have higher frequencies of figurative motifs, where the largest sub-site SWC4-01, has the highest frequencies of track and geometric motifs. This suggests that the track and geometric repertoires are used here for large group engagement, whatever the function may be. This may reflect temporal change, or palimpsest behaviour, with the overlaying of particular vocabularies or styles on others. This will be explored further in Chapter 7, when addressing superimposition and chronology of styles.

**SUMMARY**

This chapter detailed stylistic variation across the South West Creek 4 and Mourambine Kariyarra 3 engraving sites. Within the Marapikurrinya repertoire there are three distinct styles: Outline/Patterned Figurative, Linear Schematised and Infill Naturalistic. These styles include combinations of Figurative and Track and Geometric vocabularies.

There is considerable freedom within styles seen through heterogeneity amongst key motif groups e.g. stingrays, turtles, Minyiburu and Murra Murra, whilst maintaining a consistent style or Marapikurrinya way of doing. It is argued that this is particularly visible within the
Outline/Patterned Figurative style, which is highly distinctive in comparison with rock art provinces detailed elsewhere across the Pilbara (as presented in Chapter 4).

Within this small style province three different things appear to be happening:

- active group identity signalling through style and motif choices (e.g. material culture objects with repeated design patterns);
- depiction of identified mythological figures (Minyibururu and Murra Murra) which are interpreted here discretely from this identification; and,
- territorial marking around landscape/seascape identities through depiction of distinctive marine fauna (particularly turtles and stingrays).

By looking at motif choice from this large body of engravings and examining spatial distribution of these motifs, the geometric and track motifs comprise most the assemblage across these two islands, and that they are found in increasing frequencies within the areas of highest density engraving (i.e. large sub-sites). There are high levels of stylistic heterogeneity evident across the figurative motifs and some heterogeneity across track motifs.

The question of whether these styles and vocabularies change through time will be tested in Chapter 7. The analysis focuses on whether there is a continuum of styles, as suggested by motifs that combine multiple forms (e.g. Minyibururu), or whether these styles are discrete episodes. This analysis has been achieved via superimposition analysis and the application of Harris Matrices to these sequences. Additionally, potential scenes will be explored to address non-temporal understandings of the clustering and spatial arrangement of motifs.
CHAPTER 7: RESULTS – SUPERIMPOSITIONS AND SCENES: CHRONOLOGY AND DIACHRONIC VARIATION

This chapter looks at superimposition and sequencing of Marapikurrinya engravings and tests the McCarthy (1962) sequence. Five key panels are used to assess this sequence through superimposition analysis of motif classes, forms, and styles (see Chapter 6). Superimposition relationships between iconic Marapikurrinya motifs (*Minyiburu, Murra Murra, patterned Material Culture and Fauna*) are presented to further refine the sequence.

The role of narrative will also be addressed in these panels to explore whether superimpositions always reflect temporal change, and/or whether cultural story-telling through rock art scenes is archaeologically visible. This analysis will explore a different interpretation of superimposition relationship between motifs (Blundell et al. 2010).

The three key Marapikurrinya styles – Outline/Patterned Figurative, Linear Schematised and Infill Naturalistic – are explored across five large, complex panels. These panels are assessed to determine whether the styles represent consistent chronological sequencing, and whether these styles are discrete or continuous (overlapping). Following discussion of these panels superimposition sequences for *Minyiburu* and *Murra Murra*, patterned Material Culture, and Terrestrial and Marine fauna are presented. The more detailed superimposition of key motifs explores how these core Marapikurrinya motifs fit within the broader sequence. The link between Culture Hero motifs and mythological narrative, and the temporal relationships between these are also explored.

SUPERIMPOSITIONS

Previous researchers (e.g. Clegg 1977; Morwood 1981; McDonald 2008) have identified the utility of large sites to determine superimposition relationships. Large, complex panels in Marapikurrinya provide numerous superimpositions involving various styles and motif subjects. A total of 14 panels were recorded using a monopod in the field, and from these, the five largest and most complex were selected for drawing (M14-1, M14-2, M16-3, M16-4 and M16-5: using Agisoft Photoscan, Adobe Illustrator CS6 and a Wacom Cintiq tablet: Chapter 5). These have resulted in superimposition analyses which are used to test the stylistic sequence. This was done without reference to the McCarthy’s original sequence, but was instead based on the currently-defined styles: developed around form, size and motif choice (see Chapter Six).
Harris Matrices for these five panels were developed using software program Harris Matrix Composer, which has been used elsewhere to assess pigment art (e.g. Boyd 2016; Harris and Gunn 2017; Mguni 2014). This is the first use of this approach for engraved art. This software allows the grouping of motifs into perceived phases, as detailed in Chapter 5. Whilst this grouping is an inherently subjective process (Harris and Gunn 2017), the aggregation of identified stylistic groups allows for testing of the proposed sequences. The sequential ordering of styles can be checked across panels or sub-sites, and the data interrogated for consistency, and/or inversions within the sequence.

**Scenes from Superimpositions**

The locations of the five panels used for scene and superimposition analysis are shown in Figure 7.1. These panels are all located within a single sub-site – SWC4-01 – the largest sub-site recorded on both islands, with the highest densities of engraving recorded (see Chapter 6). These panels will be described, discussing the narrative elements created through spatial patterning, followed by the identification of individual superimposition sequencing.

![Figure 7.1 Aerial shot with locations of panels used for superimposition analysis](image-url)
Panel M14-1

Panel M14-1 covers an area of c. 16 x 11 metres (Figure 7.1).

This panel contains 224 motifs, and is visually dominated by seven turtles and a large outline marine motif, an outline anthropomorph, and series of spears and meandering lines (Figure 7.3). Geometric motifs are dominant (Figure 7.3), followed by track motifs. A large proportion of these are human footprints (n = 41), which are arranged in a trail, as if a human has walked across the panel.

The figurative classes make up a smaller component of this assemblage (15.6%). The material culture motifs include boomerangs (n=7), shields (n=3) and a spearthrower. Most of the animal motifs are turtles (n=7), followed by a marine motif and a stingray. The four anthropomorphs, include two small Murra Murra an outline figure; and one therianthrope – a fishman (Figure 7.2).

Each of the three identified styles are present on this panel: Outline Figurative, Linear Schematised and Infill Mixed.

- Outline/Patterned Figurative: Anthropomorph, Murra Murra, Material Culture and Zoomorph;
- Linear Schematised: Material Culture, Geometric and Tracks; and
- Infill Naturalistic: Material Culture, Tracks and Zoomorph.
Figure 7.3 Panel M14-1 with stylistic phases colour-coded (Outline/Patterned Figurative = Yellow, Linear Schematised = Blue and Infill Naturalistic = Red, Murra Murra = Purple, Undiagnostic = Grey).
Additionally, there are several motifs (Figure 7.3: grey) which have not been classified into one of the identified styles. Whilst these include examples of linear, outline or infill forms, they are not distinctive enough for stylistic classification.

Narratives in this Panel

Whilst geometrics and tracks dominate this panel numerically, two turtles and a large marine animal dominate this panel visually. This marine theme is added to by a series of smaller turtles in varying sub-styles, and a medium sized marine motif. The two large turtles and large marine animal appear composed, in that they are each engraved with the same orientation, with their heads pointing SSE, and tails pointing NNW. The two Murra Murra on this panel are relatively small, and very weathered, so are not a clear focus of this panel. Instead, a large outline anthropomorph is superimposed over one of the large turtles, and includes the highest frequency of superimpositions (i.e. number of superimposed motifs – five engravings deep) across this panel with a variety of spears, human and animal tracks, and a parrying shield superimposed (Figure 7.4).
By examining this section of the panel, and looking at the spatial relationships of the motifs, narratives can be suggested. The explicit ordering of these motifs is shown below in Harris Matrices. These motifs have variable weathering rates, with fresher motifs engraved directly over older motifs: a large outline turtle is overlain by an outline male figure, which has a thick, long infilled barbed spear through it. Here, focus shifts through these superimpositions from the turtle, to the human figure and human-made objects, such as the shield and spear. The turtle, human and shield are all within the same style (Outline Figurative), suggesting the same people are involved in this composition, whilst the spear is from a different style (Infill Mixed), suggesting multiple phases of composition. Additionally, a large infill bird track changes this marine narrative: it is clearly superimposed over the most recent turtle's head (see Figure 7.4).

**Harris Matrix and Superimpositions**

This panel involves 73 motifs in superimposition relationships, with between two to five relationships recorded (see Figure 7.5). Of the five panels, this has the highest frequency of superimpositions ($f=37.1\%$), and a considerably higher frequency than found across all motifs recorded ($f=24.8\%$).

Several motifs within M14-1 can be placed into stylistic groups (as identified in Chapter 6), and as discussed above. From this panel, the following superimposition patterns were identified:

- Nine Outline/Patterned Figurative marine examples were in superimposition relationships;
  - Two of these are internally banded (M2);
  - Six are turtles, each with a different carapace pattern;
  - One is a stingray;
  - Five of these are in two-deep superimpositions: superimposed by a linear spear, linear arc, meandering line, and superimposing arcs.
  - Four are involved in complex superimposition relationships (see Figure 7.5)

- Infill macropod tracks are all found at the top of superimpositions;

- Infill human feet are found above and below marine motifs, and above an outline boomerang. These feet range in size, number of toes, and morphology;
• The heavily weathered Murra Murra figure with a dome head and one arm visible, is below a linear bird track, and above an outline irregular oval, and outline turtle, suggesting it fits within the early development of the Outline/Patterned Figurative style;

• Patterned material culture (Outline/Patterned Figurative) is found below an infill bird track, an infill arc, an outline turtle, an infill foot, a linear spear, and both a composite and outline anthropomorph, and above an outline turtle; and

• Linear spears (Linear Schematised) are recorded over two of the three anthropomorphs (the Murra Murra and Outline motif), with a straight line (inconclusively a spear) recorded over the composite anthropomorph, over boomerangs and over a turtle.

The three Outline/Patterned Figurative style motifs involved in complex superimpositions are the two large turtles, and the outline banded marine figure that dominate the panel.

Of these three dominant motifs, the banded marine motif (#008) is involved in the simplest superimposition. It is over two motifs:

• an outline oval (probable board/shield) and infill human foot;

It is under:

• a small banded turtle with pecked dot infill; an outline SNF; three linear geometrics – parallel lines, a closed arc, and a fringe; and

• The closed linear arc which superimposes the banded marine motif is superimposed by an infill macropod track.

The central turtle (#067) is involved in a five-deep superimposition sequence. The turtle is over two motifs:

• a linear arc, and an infill human foot;

It is under seven motifs:

• two infill macropod track motifs, two chunky arcs, a linear bird track, meandering line, and Murra Murra motif. These motifs are superimposed by an infill macropod track and linear spear.
Figure 7.5 Key Superimposition relationships from M14-1 (top = most recent/surface; bottom = deepest/rock)
The other turtle (#097) is also involved in a five-deep superimposition sequence, near to the bottom of the sequence. It is over a single motif:

- Patterned shield (X1 design);

It is directly under four motifs, which are in turn superimposed by an additional four motifs:

- Outline boomerang and outline shield (E1 design), under an infill bird track and infill human foot; and,

- The turtle and shield are superimposed by a large outline anthropomorph (above in Figure 7.5), the latter of which is superimposed by two linear spears and an infill circle.

**Harris Matrix Composer: M14-1**

All motifs (n=73) involved in a superimposition relationship were entered into Harris Matrix Composer, with observed superimpositions and stratigraphical relationship indicated using directional arrows. Motifs from identified styles (Chapter 6) were grouped into Periods – or time-associated groups (see Figure 7.6).

This confirmed that the Outline/Patterned Figurative style is the earliest, with a series of internal superimpositions within this style, suggesting evolution/change internally via sub-styles. Both Linear Schematised and Infill Naturalistic styles are shown to be more recent, and whilst the Linear box is higher than the Infill box, this could reflect the limited number of Infill examples, and the lack of Infill style motifs in superimposition relationships with Linear examples. Infill Naturalistic thus appears to be the most recent of these three styles.

Several motifs are not grouped into stylistic phases. These motifs (including arcs, lines, and simple infill tracks) were excluded from explicit style grouping. Superimpositions show that these are found both above and below the three explicit styles, and are thus contemporaneous with and/or persistent throughout the art production phases.
Figure 7.6 M14-1 Harris Matrix with styles grouped into periods at a motif type level, broader style periods indicated (Outline/Patterned = Yellow; Linear Schematised = Blue; Infill Naturalistic = Red; Murra Murra = Warm Purple)
Panel M14-2

M14-2 (Figure 7.7) covers an area approximately 8 x 5 metres (Figure 7.1).

This panel contains 177 motifs visually dominated by a large Murra Murra figure in its centre. This figure (measuring 6.25m in length, with an arm-span of 4.04m) displays a mixture of form, with the head, feet and left arm enclosed by a rounded outline. The right hand is made of slightly splayed parallel lines, superimposed at the wrist by a hooked line, which may represent some kind of material culture item. Two parallel lines cross the torso, which suggest scarification. This Murra Murra is the largest example recorded during this research.

Underneath the right arm is a large outline stingray. Comparing these two largest motifs, there are minimal superimpositions under or over the Murra Murra (two small lines on the right arm, three lines in the torso, and a small spear in the lower body), suggesting it was engraved at a time when a relatively blank canvas was available. Also, this suggests that people later in time are choosing not to superimpose this motif.

In contrast, the greatest density of motifs on this panel can be found between the right arm and leg of this figure, where the ray is located – and perhaps by contrasting the weathering of both, the Murra Murra was engraved subsequently around, but not over, the ray. However, the ray has numerous (n=6) superimpositions, mainly smaller motifs, but comprising a diverse array of subject matter: human and animal tracks, boomerangs, and human figures.

In contrast with the intensively marked canvas on the right side of the Murra Murra, the left side has used less of the available canvas, with a small cluster of diverse motifs. These motifs include simple outline geometrics like circles, meandering lines, human and other animal tracks, shields, a fish, and a distinctive geometric with a series of rayed lines that end in infill circles.

Track and geometric motifs dominate (Figure 7.8), as found on Panel M14-1 and across SWC4 and MK3 generally. Here, however, tracks are more common than geometric motifs. The tracks show a roughly equal distribution between human (n=26), bird (n=20) and macropod (n=36) depictions.

The figurative motifs represent a small proportion of this panel (9.6%). However, a single anthropomorph visually dominates the panel, and represents a significant investment of energy and time (Figure 7.7). Three smaller human figures are also on this panel. As well as the large stingray, two smaller rays in different styles were recorded, as well as one liver, and one fish. Of the material culture identified, five motifs are spears, and one shield and boomerang were also recorded.
Figure 7.7 Panel M14-2 coloured by style (Murra Murra = Warm Purple; Outline Figurative = Yellow; Linear Schematised = Blue; Infill Mixed = Red; Undiagnostic = Grey)
Each of the three identified styles is present on this panel:

- **Outline/Patterned Figurative**: Anthropomorph, Material Culture, Murra Murra and Zoomorph;
- **Linear Schematised**: Anthropomorph, Tracks and Material Culture; and
- **Infill Naturalistic**: Geometric and Tracks.

Undiagnostic motifs on this panel include a variety of lines and small human and other animal tracks.

**Narratives in this Panel**

The focus of this panel is a large culture hero. McCarthy (1962) recorded that the Murra Murra came before both Minyibiru and Two Men/Wadi Gudjara. Neither of these two other forms are seen here, and hence this supposition cannot be tested on this panel.

The small multidirectional barbed spear superimposed over the lower body of this large figure could suggest aggression towards this culture hero: as well as indicating that the linear form came later in the production sequence. Perpendicular to this spear is a linear anthropomorph that fits within the same Linear Schematised style, and bird track, but it is unclear whether these are thematically related.
Additionally, two short lines are engraved over one arm, confirming this pattern of linear motifs over Outline/Patterned and Murra Murra styles.

The placement of this figure and the weathered stingray – with the latter fitted between arm and leg suggests careful placement of the two: and avoidance of each other via superimposition. Interpreting the relationship between these two motifs relies on assumptions of avoidance: these two large motifs are engraved on the one panel and the absence of superimposing one on the other suggests an active choice not to replace or obscure one image with a newer one. Based on this positioning, weathering rates, and the number of superimpositions over the ray, it is argued that the ray may be older. This will also be tested below through phase grouping of styles within a Harris Matrix.

Apart from the large culture hero there are a few minor narratives apparent in this panel. At this side of the panel, beneath the left arm of the large Murra Murra is a smaller probable Murra Murra figure, with the distinctive sets of parallel lines, fairly weathered, and with a Linear Schematised spear passing above where its head would be. There are several trails of large infilled bird tracks parallel to, over the right arm and walking towards the head of the Murra Murra figure as well as trails of milling birds on the other side; and a trail of macropod tracks which include a hopping roo which also sits down, which appear to avoid the Murra Murra but have no obvious regard for the stingray they pass over, without physically superimposing the ray. On the left side of the panel, a series of infill human and bird feet of roughly equal size travel together, and meander around two outline ovals. This could be a hunting narrative involving a hunter and an emu.

Harris Matrix and Superimpositions

This panel has 49 motifs involved in superimpositions, from two-deep to five-deep (see Figure 7.9). This panel has a moderately higher frequency of superimpositions (f=30.5%) than found generally within all recorded motifs (f=24.8%), suggesting that people are returning to this panel and actively re-marking the same place, or modifying the same narrative.

From this panel, the following superimposition patterns were identified:

- Linear bird tracks (Linear Schematised) are all found at the top of superimposition relationships (one example shown in Figure 7.9), and these tracks are all 4-toed on this panel (probably waders/non-passerine: Mulvaney 2010);
- Infill human feet are found above and below outline ovals, and below a spear (Linear Schematised);
A variety of anthropomorph types from the Outline/Patterned Figurative and Linear Schematised styles are superimposed on this panel:

- The large Murra Murra superimposes lines and an arc, and is superimposed by a linear spear (Linear Schematised);
- Two stick figures (Linear Schematised) superimpose an outline anthropomorph (Outline/Patterned Figurative), chunky line, and linear spear (Linear Schematised). Neither of these are subsequently superimposed;
  - The stick figure which superimposes the spear has schematised three-toed bird feet, and may be a bird-person/therianthrope.
- Of the two outline figures with amorphous bodies (Outline/Patterned Figurative):
  - One is superimposed by a stick figure (Linear Schematised);
  - The other is sandwich by Outline/Patterned Figurative motifs, being over an outline oval (shield design G1), and under the large stingray;
- Two Outline/Patterned Figurative stingrays with different sub-styles and body shapes (see Figure 7.9) are both superimposed by linear bird tracks (Linear Schematised); the bigger and more naturalistic style of the two superimposes an outline anthropomorph, and is also superimposed by an outline circle, linear SNF, outline and patterned boomerang (Outline/Patterned Figurative), and meandering line.

The large central Murra Murra motif has relatively few superimpositions. The only motifs below it are simple linear geometric forms, that are not explicitly of the Linear Schematised style. This suggests both that this large motif was engraved at a time where a relatively unmarked canvas was available, and that subsequently, few artists have chosen to produce marks which would cover this figure. The single spear superimposing the figure accords with the frequency of spearing seen amongst Minyiburu motifs (see below), and as discussed for these latter figures (Chapter 6), suggests aggression or at least domination of this figure. This aggression (contra an association) is reinforced by the fact that the spear is from a subsequent style group to the Murra Murra, negating contemporaneity in the narrative.

The lack of superimposition relationships with other characteristic motifs does make it difficult to place this figure in a sequence. Of note, as mentioned above, the presence of a very large and weathered stingray adjacent to this motif, but not superimposing, suggests that the two large motifs were created to fit beside each other, in some form of association, with neither replacing the other.
Figure 7.9 Key Superimpositions from M14-2
Whilst the Murra Murra and large ray at the time of their engraving did not interfere with each other, the ray motif is now barely visible because of the number of motifs engraved over and around it, in other styles, being part of a five-deep superimposition sequence. The outline ray superimposes one motif:

- An anthropomorph – which in turn superimposes an Outline/Patterned Figurative oval (undecorated shield, G1);

It is superimposed by:

- A linear SNF, outline circle, chunky line, outline and patterned boomerang (Outline/Patterned Figurative) and meandering line – the boomerang in turn is under a Linear Schematised bird track.

**Harris Matrix Composer: M14-2**

All 49 motifs involved in superimposition relationships were entered in their stratigraphic relationships into the software program Harris Matrix Composer (see Figure 7.10).

Linear Schematised motifs are the most recent grouping on this panel, with one internal superimposition with an anthropomorph over a spear. Below this in the sequence are the Outline/Patterned Figurative motifs, which include several internal superimpositions, with material culture over a Zoomorph, over and anthropomorph. The large central Murra Murra sits centrally within the same time band as the other Outline/Patterned figures, as predicted by the inclusion of this sub-type within this larger style.
Figure 7.10 M14-2 Harris Matrix with styles grouped into periods at a motif type level, broader style periods indicated (Outline/Patterned = Yellow; Linear Schematised = Blue; Murra Murra = Warm Purple)
**Panel M16-3**

M16-3 (Figure 7.12) covers an area approximately 15 x 14 metres (Figure 7.1).

This panel includes 210 motifs (Figure 7.11), with few extremely large or visually dominating motifs except for an extensive linear figure that traverses different sections of this panel. This anthropomorphic form has meandering arms and legs, with a second smaller linear anthropomorph almost joined to its left leg, and other long meandering lines and insect tracks form the most striking aspects of this panel. In addition to these linear motifs, several interesting motifs include a small dome-headed Murra Murra, a striped fish with a face, various items of decorated material culture, marine fauna including turtles, rays and jellyfish, and a large infill human foot.

Geometric (46.2%) and track (36.2 %) motifs dominate this panel (Figure 7.11): with a highly variable range of geometrics (27 types) present. Most of these are arcs, lines and simple-non-figuratives. Interesting or rare geometrics include a CXNF (a large gridded and linear outline shape, a possible net), spirals and a banded square. Macropod tracks are the most frequent track motifs (39.5%, Figure 7.13), and include both simple and combination forms (pentapedal and two sitting tracks). There are 21 bird tracks, including a rare naturalistic type (B27, see Chapter 7) where all toes and basal digital pads are engraved separately. There are clusters of linear bird tracks across the panel, with large examples in rows, or grouped closely together.

![Figure 7.11 Count of motifs by class, descending order](image)

Figure 7.11 Count of motifs by class, descending order
Figure 7.12 Panel M16-3 coloured by style (Outline Figurative = Yellow, Linear Schematised = Blue, Infill Mixed = Red, Murra Murra = Warm Purple, Minyiburu = Dark Purple, Non-diagnostic = Grey)
There are 15 human footprints, and these are scattered across the panel (Figure 7.13). One particularly large infill foot with seven toes stands out.

**Figure 7.13** Track motifs by count, descending order

The figurative motifs make up a small proportion of motifs: with 12 material culture motifs, 11 zoomorphs and eight anthropomorphs. However, a combination of the size and detail of some of these figurative motifs make them more visible on this panel. A patterned marine motif, with apparent smiling face, small rounded beak/nose, patterned interior comprised of a combination of parallel and intersecting lines, and forked tail is one such example. There is also a small dome-head Murra Murra, and several patterned infilled motifs such as a turtle carapace (minus head and limbs), shield and boomerang.

Across the motif classes there is considerable variability of form (Figure 7.14). Infill forms are present amongst all motif classes except material culture, and track motifs have the highest frequency of infill motifs and an absence of outline. Outline forms have the high frequencies amongst figurative classes: particularly anthropomorphs, material culture, and zoomorphs. Linear forms are most frequent within geometric motifs, and are recorded for all classes excluding zoomorphs.

The three identified styles – Outline/Patterned Figurative (anthropomorphs, Murra Murra, material culture and zoomorphs), Linear Schematised (anthropomorphs, material culture and tracks) and Infill Naturalistic (tracks and zoomorphic) – are each present on this panel.
Narratives in this Panel

This panel provides a diverse array of narrative options, because of the concentrated clusters of small motifs.

A unique feature of this panel is the large linear figure: the arms and legs meander across the panel, superimposing a range of Outline/Patterned Figurative motifs. The arms and legs appear to be made of a combination of different Linear Schematised motifs, where an angled insect track joins up with a line to become the right leg, and a bird track joined to a line forming the hand and arm. It is possible that this stick figure came later, and is the result of someone joining together a series of disparate motifs into one figure. Additionally, off the left leg of this large figure is a smaller stick figure, which also superimposes a series of Outline/Patterned Figurative motifs, including a stingray and turtle shell. It is possible this figure uses the leg line of the larger figure as its arm line, or the arm line of the smaller figure is engraved to suggest a continuation of the larger figure, linking the two.

The Murra Murra figure on this panel, again (see M14-2), has few superimpositions. It is positioned by itself to the side of the main activity foci of this very busy panel. A thicker outline arc, probably unrelated, is positioned above its head. The positioning and different technique suggest this is a later addition: whether this thick arc represents a boomerang and/or conflict is unclear.

A marine theme is in evidence on this panel through the figurative motifs, whilst a terrestrial theme is suggested by the number of macropod tracks. The marine fauna present includes...
several different animals – fish, jellyfish, stingray and turtle – depicted in a variety of sub-styles within the Outline/Patterned Figurative style.

**Harris Matrix and Superimpositions**

This panel has 45 motifs involved in superimpositions: from two-deep to four-deep (see Figure 7.15). This has the lowest frequency of superimposition (23.8%), of the five panels a slightly lower frequency than the average across all motifs recorded (24.8%), which is significant considering the density of engravings, and presence of all major styles.

The motifs on panel M16-3 were placed into their stylistic groups to investigate their superimposition relationships. On this panel, we can identify:

- Outline/Patterned Figurative (marine fauna and material culture);
- Linear Schematised (anthropomorphs, bird tracks and material culture); and,
- Infill Naturalistic (macropod and bird tracks and human feet).

This panel reveals the following superimposition patterns (see Figure 7.15):

- Outline/Patterned Figurative marine motifs are superimposed by a stick figure (Linear Schematised);
  - Two sub-styles of Outline/Patterned Figurative marine motifs – a banded infill (M2) and stingray are not superimposed by any motifs, but are over concentric arcs and a line, respectively;
- Linear Schematised stick figures are superimposed by a variety of motifs including an infill oval and a Linear Schematised bird track;
- Outline/Patterned Figurative material culture here superimposes no motifs, but are each superimposed, including by Linear Schematised spears;
- Linear Schematised material culture is superimposed by no motifs, but superimposes an Outline/Patterned Figurative boomerang;
- Infill human feet are found at the top of the sequence; and
- Most superimpositions include long straight to meandering lines, including a three-deep superimposition of lines alone.
Harris Matrix Composer: M16-3

All 45 superimposed motifs were entered into a hierarchical structure and organised by the identified styles phases (see Figure 7.16).

This Matrix shows the three keys styles in the predicted sequence: The Infill Naturalistic motif is the most recent. This is followed by the Linear Schematised motifs which include one internal superimposition, where a linear bird track sits above a stick figure anthropomorph. The oldest style is the Outline/Patterned Figurative, and there is one reversal displayed here in the matrix (Figure 7.16, orange oval), where a line sits above an outline boomerang. However, this reversal fits the stylistic sequence.
Figure 7.15 Key Superimpositions from M16
Figure 7.16 M16-3 Harris Matrix with styles grouped into periods at a motif type level, broader style periods indicated (Outline/Patterned Figurative = Yellow; Linear Schematised = Blue; Infill Naturalistic = Red; Reversal in sequence = Orange Oval)
**Panel M16-4**

M16-4 (Figure 7.18) covers only 6m x 8 metres (Figure 7.1), and is the smallest panel used in the superimposition analysis.

This panel has 141 motifs (see Figure 7.17), most of which are either geometric (48.9%) or tracks (31.2%). The figurative component is slightly higher than found on the other panels (19.0%), and there is a relatively high proportion of material culture motifs recorded (12.8%).

![Motif Count by Class](image)

**Figure 7.17** Panel M16-4 Motifs by Class and Count

The panel is crowded and busy, given there are 141 motifs on this relatively small surface (48m²). There does not appear to be a structured composition: but there are several dominant motifs including two outline turtles with patterned infill, one patterned spearthrower and two patterned shields. There is a cluster of outline circles, and a shield superimposed over a Minyiburu figure (Figure 7.18).

A total of 19 geometric motifs types are identified here, dominated by arcs, lines, ovals and SNF motifs. There is one concentric circle, where the central circle is a small vugh within the rock surface. Track motifs, both human and other animal, occur across the panel. Of these, macropod tracks are the most common. There are 12 human footprints, and these on average are larger than other animal tracks on this panel, and larger than life-size. A trail of four travel through the centre of the panel.
Figure 7.18 Panel Ms6-4 Illustration coloured by style (Outline/Patterned Figurative = Yellow, Linear Schematised = Blue, Infill Naturalistic = Red, Minyiburu = Dark Purple, Non-diagnostic = Grey)
Material culture is the most frequent figurative class: there are 10 spears, four boomerangs, two shields, one spear thrower and one shoe identified. Many of these spears superimpose other motifs, and the two patterned shields (with different designs) are engraved close to each other. The six marine zoomorphs include a stingray, turtle and a jellyfish. All three anthropomorphs on this panel are Minyiburu: One is over a patterned infill boomerang, and under a line, one is under an outline and patterned turtle, and one is under a (D5 design) shield. Two of these Minyiburu are of a similar dome-headed, U-shaped body style (C), and the third is in an OA style (see Chapter 6), with irregular body line. The placement the Minyiburu on this crowded panel is in stark contrast to the Murra Murra motifs on panels M14-2 and M16-3. The motifs they are associated directly with through superimposition are other Outline/Patterned Figurative motifs, linking them to turtle and patterned shields (D5 design).

This panel has higher frequencies of linear motifs than the other analysed panels (Figure 7.19). Linear motifs are found within anthropomorph, geometric, material culture and track classes, with high frequencies amongst geometric and material culture motifs. Infill technique are seen amongst geometric and zoomorphic motifs in low frequency, and at a high frequency amongst tracks. All classes include outline motifs, with the highest frequencies in the three figurative classes. Only the Geometric and Track classes include all three forms.

![Figure 7.19 Motif Classes by Form Frequency](image-url)
Narratives in this Panel

Of the five panels explored, this panel has the highest density of engravings. It represents a palimpsest of activities, indicating this spot as a preferred location along this ridge for engravings. This concentration of motifs engraved on, around and over each other, suggests that there is a narrative connection between these engravings. For example, the identity-rich Minyiburu motifs and shield designs: there are two examples of each, all engraved in proximity to each other (Figure 7.18), and are all within the same style group. This composition could be interpreted literally: that the mythical beings represented are carrying shields - as suggested in the mythologies. Alternately, if both motif types are interpreted as representations of group identity, where Culture Heroes connect mythological narrative and religion to place, and shield designs project culture affinities and active group marking (Wobst 1977) the close physical association of these motifs links mythology to object and place.

Minyiburu here are also shown in association with marine fauna: one is superimposed by a large turtle, while the other is positioned next to a jellyfish. The head shape and presence of two eyes makes for significant visual similarity between the turtle and human figure, with these characteristic stylistic signatures possibly reinforcing both a stylistic and narrative connection between the two.

The two shield motifs towards one edge of the panel are located within the densest area of engraving, in association with several large infill human feet, fringes and spears, and in close association with a cluster of outline circles (probable eggs – either turtle or emu). The shield motif superimposed over the Minyiburu motif has a single wavy vertical line design (D5: see Chapter 6). Its placement suggests either an assertion of identity over Minyiburu, or perhaps the superimposition suggests a new alliance of an older mythology with a new identity. Shields are publicly displayed objects, and when interpreted within information exchange theory, their designs are argued to be as ideal signallers of individual, local, and regional group identity (McDonald and Harper 2016). This type of individual identity may well be distinct from cultural identity as expressed through mythological narratives – which link locales across the landscape and Country – which can be interpreted as unifying groups.

Whilst macropod tracks are the most frequent (n=24) tracks, these are generally small, and either represent wallaby tracks or smaller than life-size kangaroo tracks. This observation about scale is particularly cogent in comparison with the depicted human feet on this panel: which are larger than life size. These are argued to represent two separate narratives based on lack of close spatial association, and difference in styles.
Harris Matrix and Superimpositions

The 52 motifs involved in superimpositions on this panel are from two-deep to four-deep (see Figure 7.20). This panel has the second highest frequency of superimpositions (36.9%) - and this is considerably higher than the average across all motifs. The density of motifs and high levels of superimposition suggest this is a focal point for engraving activity along this ridgeline. This may result from the availability of canvas i.e. a large, open rock surface. Otherwise, there are no resources that mark this section of the ridge as more desirable than elsewhere.

The motifs on M16-4 were categorised according to sub-stylistic groups:

- Outline/Patterned Figurative: Minyiburu, material culture and marine fauna;
- Linear Schematised: material culture; and
- Infill Naturalistic: material culture and tracks.

From this panel, the following superimposition patterns were identified:

- All Minyiburu are superimposed, by a variety of motifs including an outline turtle, and outline and patterned shield. Only one Minyiburu superimposes other motifs: including an outline boomerang, linear spear and linear fringe;
- Linear Schematised spears are frequently involved in superimpositions, both above and below infill human footprints, over turtles, and boomerangs; and below a Minyiburu, outline boomerang and outline shield (E1) design;
- Six Outline/Patterned Figurative material culture motifs (shields, a spear-thrower and boomerangs) were identified in this panel, with and without interior patterning:
  - The two outline and patterned shields have no superimposed motifs, but superimpose a Minyiburu figure and a linear spear;
  - The outline and patterned spear-thrower superimposes an infill human foot;
  - The outline and patterned boomerangs are all superimposed by a turtle, Minyiburu, linear spear and linear 4-toed bird track: two boomerangs superimpose an outline SNF and linear spear.
- Both Outline/Patterned Figurative turtle motifs are superimposed by Linear Schematised spears, in addition to linear dashes and an infill macropod track. One turtle also superimposes a Minyiburu and outline boomerang;
- Infill macropod tracks are found under a shield motif, and over a turtle motif; and
- Infill human footprints are found both over and under linear spears, and under an outline and patterned spear-thrower.
Figure 7.20 Key Superimpositions from M16-4
Interesting superimpositions on this panel include the engraving of a Minyiburu over an earlier spear motif, as the pattern is usually the reverse. This same Minyiburu is also engraved over an outline and patterned boomerang. This placement in association with these weapons suggests some kind of narrative purpose, likely around aggression/replacement that connects all three motifs through the Minyiburu placement. The Minyiburu motif itself is depicted in an uncommon style (Sq: see Chapter 6).

The placement of shields on this panel is interesting, with a D5 design shield engraved over a Minyiburu, linking these two motifs. An E1 design shield is engraved over a pair of macropod tracks, the latter not commonly superimposed.

In summary, this panel has a few sequence reversals not seen on other panels, particularly the Outline Patterned Figurative superimposing a Linear Schematised spear. This raises a question about whether the explicit styles are discrete, and supports a continuum of styles, with particular technique/form preferences flourishing, or being more popular, at different times.

**Harris Matrix Composer: M16-4**

The 52 superimposition relationships were entered into Harris Matrix Composer and grouped by identified styles into Periods (see Figure 7.21).

The most recent style on this panel is a single example of Infill Naturalistic. This sits above the Outline/Patterned Figurative motifs, with the Minyiburu sub-style below this. The earliest style identified by this Harris Matrix is the Linear Schematised style. However, there are several reversals identified by Harris Matrix Composer (Figure 7.21) highlighted by arrows which head up (orange ovals): this suggesting that much of this panel may have been engraved either before the Outline/Patterned Figurative or have been produced contemporaneously. It is also probable that a single inversion has created this issue – with a linear spear superimposed by an outline boomerang.
Figure 7.21 M16-4 Harris Matrix with styles grouped into periods at a motif type level, broader style periods indicated.
**Panel M16-5**

Panel M16-5 (Figure 7.23) measures c. 23 x 12 metres (Figure 7.1) and is the largest used in this superimposition analysis.

A total of 583 motifs were recorded here (Figure 7.22). At the western end of the panel is a large human figure holding an ‘A1’ design shield. Aside from this motif, larger and more dominant motifs include a net, turtles, spears, and other shield motifs with designs. Engravings are near continuous along this section of the calcarenite ridge, with high levels of superimposition.

The most common motif class recorded on this panel are tracks (48.5%) followed by geometric motifs (38.6%) (see Figure 7.23). The figurative motifs make up a relatively small component (n=74, f=15.32%), with material culture dominating.

![Image](image)

**Figure 7.22 Count of Motif Classes in descending order**

One grinding patch was recorded on this panel. This grinding patch is oval in shape, and filled with some sediment at the time of recording. This patch could be an axe-grinding groove; however, its shape and relative flatness suggest it was used for other purposes. Analysis indicates that this has been ground over an outline marine motif (see Figure 7.24). There is an extensive surface scatter of *Anadara granosa* at the base of the ridge line.
Figure 7.23 Ms6-5 Illustration coloured by style (Outline Figurative = Yellow, Linear Schematised = Blue, Infill Mixed = Red, Minyiburu = Dark Purple, Non-Diagnostic = Grey)
Figure 7.24 Broad shot and close-up of grinding patch and superimposed fish

Arcs, various lines, ovals and SNF’s are the most frequent geometric motifs, with 36 motif types identified in this panel. Unusual or rare geometric motifs recorded here include a single CXNF – an infill oval inside an outline oval, surrounded by triangular lines (possibly representing a stylised Minyiburu), a concentric circle, a spiral, and a star.

The track repertoire includes bird, dog, human, insect and macropod tracks (Figure 6.25). Macropod tracks were recorded in very high frequencies here, followed by human footprints
and bird tracks. A small number of insect tracks (n=4) were identified, as well as a single dingo track.

![Track frequencies from M16-5](image)

**Figure 7.25** Track frequencies from M16-5

Material culture visually and numerically dominates the figurative classes (n=42, f=63.64%). Shields are most frequent, followed by spears, boomerangs and spear-throwers (Table 7.1).

<table>
<thead>
<tr>
<th>Material Culture</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shield</td>
<td>17</td>
</tr>
<tr>
<td>Spear</td>
<td>13</td>
</tr>
<tr>
<td>Boomerang</td>
<td>10</td>
</tr>
<tr>
<td>Spearthrower</td>
<td>2</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>42</strong></td>
</tr>
</tbody>
</table>

**Table 7.1** M16-5 Material Culture count

The shield cluster on this panel represents a sizeable sample (7%) of all shields recorded, and multiple designs are found here (see Figure 7.27). While most of these are blank shields (style ‘G1’), curvilinear designs (A1-4) comprise almost half of the sample, with several wavy designs (D) and linear designs (E) also present (Figure 6.26). This panel demonstrates the most definitive composition of a shield being ‘held’ by an anthropomorph anywhere amongst the Marapikurrinya assemblage (Figure 7.27). As described below, this figure may be a composite Minyiburu figure, where human features are added to material culture.
Figure 7.26 Shield Designs from M16-5

Figure 7.27 Composite anthropomorph ‘holding’ A2 shield
There are three Minyiburu and one composite figure (Figure 7.27) amongst the anthropomorphs. This composite figure is located at the western end of the panel, with the shield positioned such that it appears to be holding the shield. It has the rayed headdress common to Minyiburu, as well as a roughly dome shaped head. The left side of the body is not visible, the right leg below the shield is a partially complete anatomical outline leg. The body itself may have originally been an older, weathered shield. The other three Minyiburu figures are either located amongst or are superimposed by other motifs.

There is an array of fauna on this panel: most frequently, stingrays (n=5) general marine (n=4), jellyfish (n=1), turtle (n=1) and snake (n=2). The single turtle motif appears to be part of a fishing scene, with a large rayed parallel line motif which converges at one end: possibly representing a net. There is one unique unidentified marine fauna here with a long oval body, banded and pointed at one end, with small semi-circular flippers around its perimeter.

There is no single dominant form on this panel and motif classes are depicted in multiple styles.

- Outline/Patterned Figurative: material culture and zoomorphs;
- Linear Schematised: geometrics, material culture and tracks; and
- Infill Naturalistic: tracks and zoomorphs.

Each of the three styles is well represented on this panel, however there are relatively few anthropomorphs, including the absence of Murra Murra.

**Narratives in this Panel**

This panel has near continuous engraving on all available rock surfaces. The number of shield motifs with designs, many with curvilinear designs, suggests clear identity and territorial marking. The largest shields are those with curvilinear designs, and the only example of an isolated motif away from the main conglomeration of engraving activity is an A1 design shield, with this space making the shield highly visible. Additionally, the shield being ‘held’ by the large composite human figure is an A1 design shield, however it is possible that the body of this figure is an older weathered shield engraving with a different design, which has been superimposed by this A1 shield, and modified with the addition of a head outline, headdress, and leg, creating a composite figure.
Marine fauna again dominates animal representations, with several sub-styles within the Outline/Patterned Figurative style used here. However, the animals are largely crowded or superimposed, suggesting either they are being replaced, or are no longer the focus of the engraving activity here or that they continue to be replicated on this panel. There are a number of correlations between fauna and spears, and a potential net, representing hunting or fishing activities.

**Harris Matrix and Superimpositions**

From this panel 158 motifs are involved in a superimposition, from two-deep to five-deep (see Figure 7.28). Despite its large size, this panel has the second lowest frequency of superimpositions (F=27.1%), although this is still higher than the average across all motifs recorded.

Many motifs from the M16-5 panel can be placed into the defined styles: Outline/Patterned Figurative (marine fauna, material culture and Minyibiru), Linear Schematised (material culture), Infill Naturalistic (human, macropod and bird tracks) and Minyibiru. This panel revealed the following superimposition patterns:

- Infill human footprints are involved in numerous superimpositions (n=25), but only two of these are under other motifs: significantly an outline and banded marine motif.
  - Feet are over linear fringes, turtle shells, outline arcs and outline and patterned shields;
  - There are two Outline Figurative motifs (a turtle and an E1 design shield) where three feet are superimposed.
- Infill macropod tracks are involved in numerous superimpositions (n=19), largely superimposing other motifs including an outline banded marine motif, linear design (possible net) and a Minyibiru;
- Infill bird tracks superimpose a range of motifs including an outline boomerang, outline oval and shield, with no superimpositions over them;
- Linear bird tracks (both three and four-toed) also superimpose a range of motifs including a linear design (possible net), stingray and macropod track, with no superimpositions over them;
- Linear spears are less common in superimpositions than outline material culture on this panel, found superimposing outline boomerangs, with no superimpositions over them;
Figure 7.28 Key Superimpositions from M16-5
• Outline material culture is relatively plentiful (n=18) including 11 shields:
  o One shield (G1 design) superimposes another shield (D5 design);
  o Three shields are blank/non-patterned, with two examples superimposed by the same line;
  o Three E1 shield designs are all superimposed by an infill bird track, multiple infill human feet, and macropod tracks: one of these shields also superimposing an outline boomerang with no patterning;
  o Two A1 and one A2 design shields are identified, and superimpose an outline and patterned boomerang, and includes superimposition of one shield by macropod tracks; and
  o One A4 shield is involved in a more complex superimposition, over a Zoomorph head and Minyiburumotif: which in turn is superimposed by an infill human foot.

• Outline/Patterned Figurative boomerangs show a variety of designs including B-B1, B-B3 and B-C1, and are frequently superimposed including by other outline boomerangs of the same design (B-C1), shields, outline marine fauna, infill human feet and a stingray;

• A variety of outline marine fauna are in superimpositions on this panel, including turtles, naturalistic marine fauna (M5), banded outline marine and various styles of stingrays:
  o Turtles are superimposed by infill human feet;
  o Banded outline marine motifs superimpose infill human feet, outline and patterned boomerangs, and are superimposed by macropod tracks; and
  o One stingray is superimposed by a linear bird track, the second has no superimpositions over it, whilst both superimpose other motifs including a patterned outline boomerang and line.

Due to the size of this panel, and number of unique superimpositions recorded, the software program Harris Matrix Composer was unable to calculate phases or periods for these motifs, highlighting a limitation with this methodology. A variety of motifs were entered to determine maximum capability, which appears to be around 100 entries to group by phase.

SUPERIMPOSITION PANELS COMBINED

Motif Choice, Form and Style

The superimposition sequences observed on these five panels, reveal variability between motif choice and form which can be described via the frequency of three identified styles. The panels
range size from 141 motifs (M16-4) through to 583 motifs (M16-5). Panel size and motif diversity is not necessarily linked: i.e. smaller assemblages can include greater variability of style and/or motif types. For example, when comparing panels M16-4 and M16-5 (the smallest and largest respectively), the former has Outline/Patterned Figurative and Linear Schematised anthropomorphs, where the latter has a very limited anthropomorph range, marked by a unique composite/outline figure and Minyiburu, to the exclusion of Linear Schematised or other Outline/Patterned Figurative anthropomorphs from its 583 motifs (see Figure 7.29).

![Bar chart showing motif distribution across various panels](image)

**Figure 7.29** Large panels (M14-1, M14-2, M16-3, M16-4 and M16-5) comparing by motif class and form, sorted by size

- **Anthropomorphs:** Outline/Patterned Figurative styles are the most frequent, and found across each panel – with Murra Murra found on M14-1, M14-2 and M16-3, and Minyiburu on M16-4 and M16-5; Linear Schematised styles are on three panels, in lower frequencies, and infill only seen within Minyiburu hands/feet, and an arm recorded on M16-4; anthropomorph frequency is low across all panels, with the highest concentration recorded on M16-3 (Figure 7.30) – whilst noting that M14-2 is physically and visually dominated by a 6 metre long Murra Murra.
• Geometric: Linear geometrics dominate (40-50% of all motifs) across all five panels, with small frequencies of infill and outline motifs on each panel (Figure 7.29, Figure 7.30).

• Material Culture: styles vary considerably between panels, with Outline/Patterned Figurative being dominant on panels M14-1, M16-3 and M16-5, Linear Schematised dominant on M14-2, and roughly equal proportions of the two on M16-4, the panel with the highest frequency of material culture motifs (Figure 7.30). A rare infill spear was identified on M16-1.

• Track: Across all panels infill tracks were most common (Figure 7.29), with explicit Infill Naturalistic tracks particularly prevalent on M14-1, M16-3 and M16-5. Linear Schematised tracks are most prevalent on M16-3 and M16-5, and a small sample of outline components were recorded on M14-2 and M16-4; M14-2 and M16-5 provide examples where tracks formed the dominant motif type (as opposed to geometrics, Figure 7.30) in contrast with the broader pattern from SWC4 and MK3.

• Zoomorph: Outline/Patterned Figurative style animals dominate across all panels (Figure 7.29), some Infill Naturalistic motifs were identified in low frequencies on M16-3, M16-4 and M16-5, and a handful of Linear Schematised snakes on M16-5. Zoomorphs were recorded in relatively low frequencies (<5%) across all panels (Figure 7.30).

![Image of a bar chart showing motif type frequency across the five large panels.](image-url)

**Figure 7.30** Motif type frequency across the five large panels
HARRIS MATRIX AND SUPERIMPOSITIONS ACROSS ALL PANELS

Comparison of the identified periods across the four complex superimposition sequences which could be accommodated by the software (panels M14-1, M14-2, M16-3 and M16-4) raises certain questions:

- Does grouping the identified styles or motifs into periods show a sequential change throughout the sequence?
- Are motif styles consistently engraved in the same order?
- Can discrete areas be put into a sequence of activity through time? i.e. does one panel focus earlier styles of engraving, compared with another?

McCarthy's (1962) sequence was revisited (excluding the earliest phase: abraded grooves, which is irrelevant):

2. Outline anthropomorphs, zoomorphs, and material culture, developed into outlines decorated with striped, barred and other line designs;
3. Linear designs of concentric circles, pubic aprons, feather plume ornaments, grid, parallel sinuous lines, arcs, and many others; and,
4. Pecked infill/intaglios of anthropomorphs, zoomorphs and material culture.

Broad grouping of motif classes by form were used here to test McCarthy's sequence: and the Harris Matrices for panels 14-1, 14-2 and 16-3 showed relatively consistent patterns, and ones which are broadly consistent with McCarthy's model. The styles described in Chapter 6 redefine McCarthy's phases. To reiterate, these are:

- Outline/Patterned Figurative;
- Linear Schematised; and
- Infill Naturalistic.

The Harris Matrices show that the Outline/Patterned Figurative style is the oldest style, Infill Naturalistic the most recent, and Linear Schematised located between the two. There is only one notable inversion (on panel M16-4). Murra Murra and Minyiburu sub-styles fit within the broad timeframe of the Outline/Patterned Figurative style, confirming them as part of this defined style period. The Outline style is shown on M14-1 and M14-2 with a longer (vertical) phase box (Figures 7.6 and 7.10), suggested this style lasted for a longer period of time – or period of most intensive art production – than the more recent styles. Detailed superimposition analysis supports McCarthy's sequence: that Outline motifs were amongst the earliest style, including
shields, marine fauna and Minyiburu; succeeded by Linear motifs, such as spears; and Infill motifs, such as large macropod and emu tracks, as being amongst the most recent style.

Several motifs are not included in these three explicit styles. Through the Harris Matrices it can be seen that these motifs occur throughout the sequence, both above and below these styles, and include a variety of geometrics including lines, outline circles, human footprints, and simple infill bird and macropod tracks. These motifs are seen as persistent elements which – because of their undiagnostic nature – do not help refine the chronology. The presence of these persistent motifs, and their relationship with motifs that are within the sequential styles, will be explored further in the discussion.

**SUPERIMPOSITIONS OF MOTIF TYPES**

Of the 8,320 motifs recorded across SWC4 and MK3, 2,062 (24.8%) are involved in a superimposition relationship of one kind or another. The analysis now focusses on specific motif types to further refine this sequence, using key Marapikurrinya types: the Minyiburu, Murra Murra, Material Culture and Zoomorphs.

The frequency of superimposition varies across motif classes (Figure 7.31). This is determined by a simple binary, noting if a motif is involved in a superimposition – either the motif is under or over another – or not involved in one. This shows which motif types are being engraved in empty space, and then not engraved over at a later time.

Whilst all groups excluding Therianthropes are more likely to not be in a superimposition relationship, figurative classes each have higher frequencies than either tracks (lowest frequency) or geometric motifs. As a clear majority of these figurative motifs (Anthropomorphs, Material Culture and Zoomorphs) fall within the earliest style – Outline/Patterned Figurative – it could be predicted that they have higher frequencies of superimposition rates. However, as touched on above, superimpositioning by more recent styles may be an active way of making a point of difference between past ways of doing, and the current choices and identities being promoted.
Superimposition relationships of characteristic Marapikurrinya motif types are investigated further. These groups are all selected as key markers of Marapikurrinya identity. The superimpositions between these motif types from across SWC4 and MK3 will hopefully provide a more nuanced understanding of changing identity information through time.

Of specific interest is the chronological framing of these distinctive Marapikurrinya motifs, and whether these persist or are exclusive to phases in the repertoire through time.

**Culture Heroes: Minyiburu and Murra Murra**

**Minyiburu**

Over half of the 66 recorded Minyiburu motifs, (56.1%) are involved in superimposition relationships.

- **13** ($f=35.1\%$) Minyiburu are under no other motifs, and of these:
  - Ten superimpose other motifs;
  - Three superimpose no motifs.

- **17** ($f=45.9\%$) Minyiburu have no motifs superimposed over them;
Minyiburu are found in superimposition relationships with each of the motif subjects: Anthropomorph, Geometric, Material Culture, Tracks and Zoomorphs:

- For most motif classes similar frequencies both superimpose, and are superimposed by, Minyiburu (Figure 7.32);
- Material Culture is the exception to this pattern. Significantly more material culture motifs superimpose Minyiburu, than are superimposed by Minyiburu:
  - Of these, 5 are boomerangs, 4 are spears and 2 are shields.

**Murra Murra**

Over half of the Murra Murra motifs identified (14, 58.3%) are involved in superimposition relationships (e.g. Figure 7.33).
Figure 7.33 Murra Murra with Boomerang superimposed over an arm/torso line

- 92.9% of these Murra Murra are superimposed by other motifs; and
- Of the 13 Murra Murra motifs in superimposition relationships, there 17 superimposing motifs either under or over Murra Murra.

- Of the 14 Murra Murra involved in a superimposition:
  - 13 have motifs over them;
  - 4 superimpose other motifs; and conversely 10 are over no other motifs;
    - Of the four Murra Murra which superimpose motifs, there are 6 individual superimposed motifs;
    - These four motifs are also each superimposed by other motifs.
- One Murra Murra is superimposed by a single Minyiburu;
- Murra Murra are predominantly superimposed by geometrics, with some material culture and track motifs, and a single Zoomorph also found over them (Figure 7.34, 7.35);
  - The dominant form of these superimposing motifs is linear, with some infill and outline examples.
- Murra Murra motifs are only found superimposing two motif classes: Geometric and Material Culture motifs: these are linear and outline in form (Figure 7.34).
Similar frequencies of both Minyiburru and Murra Murra motifs are involved in superimposition relationships. However, c.93% of Murra Murra motifs are superimposed underneath other motifs while only c.65% of Minyiburru are superimposed under other motifs.

The motifs that most commonly superimpose these culture heroes are geometric and linear motifs. Very few anthropomorphs are found superimposing Murra Murra motifs but the
frequency of material culture superimposing Minyiburu is much higher than found with the Murra Murra.

Both culture heroes have similar frequencies of motifs that they superimpose: c.55% of Minyiburu superimposing other motifs, and c.41% of Murra Murra. This means that Murra Murra are thus much more likely to be under than over other motifs. Minyiburu motifs superimpose all motif types – including another Minyiburu and a Murra Murra – but most commonly they superimpose geometric motifs. In contrast Murra Murra motifs superimpose only two motif classes: geometrics and material culture. The Minyiburu motifs superimpose all form groups with relatively equal frequencies, where Murra Murra do not superimpose any infill motifs.

These combined superimposition relationships suggest that the Murra Murra are an older style of anthropomorph than the Minyiburu. As both were not recorded on the same panels as discussed above, these superimpositions help confirm that these figures form part of the earliest Outline/Patterned Figurative style, during which there appears to have been a shorter engraving period for Murra Murra, and a more extended period for Minyiburu. This conclusion is in accord with the range of forms found across Minyiburu figures i.e. the inclusion of infill/intaglio hands and feet on some figures. Possibly the Minyiburu figures outlast the remainder of the Outline/Patterned Figurative style, and remain in use/continue to be engraved as other styles proliferate within the assemblage.

SHIELDS AND OTHER DECORATED MATERIAL CULTURE

Shields

Of the 230 recorded shields, 89 (38.7%) are involved in superimposition relationships.

- Over half of the shields (49; 56.3%) are superimposed by other motifs;
- Over a third of these shields (35; 40.2%) superimpose other motifs;
- Shields superimpose, and are superimposed by anthropomorphic, geometric, material culture, tracks and zoomorphic classes;
  - Shields superimpose and are superimposed by similar frequencies in all motif classes excluding tracks. Significantly more tracks superimpose shields than are superimposed by shields (Figure 7.32).
- There is one instance of a grinding groove superimposing a shield engraving.
Figure 7.36 Shield motif showing superimposition relationships with different classes

- Shields are superimposed by and superimpose all three major form categories: infill, linear and outline (Figure 7.36);
  - Infill motifs (mostly animal tracks) are more often superimposed over shields (n=22), than under (n=4; Figure 7.37).

Figure 7.37 Shield superimposition relationships and form classes under (orange) over (blue) shields
Six of the design groups (A, C, D, E, G and H, see Chapter 6) are found in superimposition relationships (Figure 7.39):

- Design group D (Figure 7.38) is the most frequently superimposed (n=21), followed by A (n=10), and G (n=8);
  - This suggests there is a sequential change from group D to group A designs;
  - The superimposition of G designs over D also suggests replacement of the D designs, however as the G design is blank (unpatterned) this isn’t providing the same explicit identity information garnered from the complex A designs.

- Across design groups a variety of motif classes are superimposed over these shields:
  - All broad motif classes (Anthropomorphic, Geometric, Material Culture, Tracks and Zoomorphic) superimpose D motifs (see Figure 7.39);
  - Tracks superimpose all design groups.

![Figure 7.38 D-design shields (wavy designs) which are found below A-design shields](image-url)
Figure 7.39 Shield Design groups and superimposed motif classes

Boomerangs

Of the 143 boomerang motifs with patterns, 44 (f=30.8%) occur in a superimposition relationship.

Figure 7.40 Patterned Boomerangs by Motif Class and Superimposition relationships

- All major motif classes are both superimposed by, and superimpose boomerang motifs (Figure 7.40):
Similar frequencies are observed between all classes, apart from anthropomorphs, which are more than twice as likely to be under boomerang motifs;

- This composition relationship between anthropomorphs and boomerangs provides an indication of narrative; and

- Track motifs are significantly more likely to be superimposed over (n=10) boomerangs, than under them (n=2).

There are similar frequencies when looking at form groups being both under and over outline/patterned boomerangs:

- Outline motifs are the most frequently superimposed by boomerangs, and second most frequently superimposed over boomerangs;
- Linear motifs are the most frequently superimposed over boomerangs, and second most frequently superimposed by boomerangs;
- Infill motifs have different frequencies, being uncommonly under boomerangs, and more commonly over boomerangs (Figure 7.41).

![Figure 7.41 Patterned Boomerangs by Form and Superimposition relationships](image)

**Spear-throwers**

Of the sixteen patterned spear thrower motifs, five ($f=31.3\%$) are involved in superimpositions.
• There are no outline motifs in superimposition relationships with spear-throwers, infill motifs are equally frequent above and below, and linear motifs are only found below;
• Anthropomorphic, geometric and track motifs superimpose spear-thrower motifs; and Geometric and track motifs are superimposed by spear-throwers.

**FAUNA: TURTLES AND STINGRAYS**

Over half of the 200 zoomorphic motifs identified (114; f=57%) are in superimposition relationships:

• 110 motifs are superimposed by zoomorphs; and
• There are 53 motifs which are over zoomorphs.

There is considerable variability between motif class above and below Zoomorph motifs:

• Anthropomorphic motifs are more frequently superimposed by zoomorphs; and
• Geometric and track motifs more frequently superimpose zoomorphs (Figure 7.42).

![Graph showing Superimposing and Superimposed motifs by Class](image_url)

**Figure 7.42** Zoomorph Superimposition relationships by Class, under (orange) and over (blue)
Figure 7.43 All Zoomorphs by Form and Superimposition Relationship

- In superimposition of tracks and geometrics over zoomorphs:
  - Most geometric figures superimposing zoomorphs are largely linear, while most tracks are infill (Figure 7.43);

- Zoomorphs are more likely to be superimposed than superimpose other motifs.

Turtles

Of the 122 turtles recorded, 54 are in superimposition relationships – totalling 55 motifs over 42 turtles, and 14 motifs under 12 of the turtles:

- 42 of these have motifs superimposed over them:
  - A total of 55 motifs are superimposed over turtles;
  - The majority of these 42 motifs are geometric (n=26), followed by material culture (n=15) (Figure 7.34); and
  - All form types are represented, with linear motifs most commonly over turtles (Figure 7.45).
• 12 turtles are superimposed over other motifs:
  o A total of 14 motifs are superimposed by these 12 turtles.
  o All motif classes are represented in low frequencies, mirroring the same frequency distribution as motifs above the turtles; and
  o There is no dominant form amongst superimposed forms (Figure 7.45).
Stingrays

Of the 107 stingrays recorded, 42 are in superimposition relationships:

![Stingrays by Motif Class and Superimposition Relationship](image)

**Figure 7.46 Stingrays by Motif Class and Superimposition Relationship**

- **25 of these have motifs superimposed over them:**
  - A total of 31 motifs are superimposed over these 25 stingrays;
  - Geometric (n=14) and Track (n=11) motifs are the most common motifs over stingrays, with small numbers of Material Culture (n=5) and one Anthropomorph (Figure 7.46);
  - Correspondingly, linear motifs are most frequently superimposed over stingrays (n=17), followed by infill (n=10) and outline (n=3) (Figure 7.47).

- **16 of these stingrays superimpose other motifs:**
  - A total of 18 motifs are superimposed by these 16 stingrays;
  - A broader range of motifs are superimposed by stingrays, with all major classes included:
    - Similar frequencies of anthropomorphic, geometric and material culture motifs are both over and under stingray motifs;
    - There are significantly fewer track motifs below stingrays than above;
    - Zoomorphs are only found below stingrays;
Across form categories infill motifs have a very low frequency below stingrays, including in comparison with superimposition frequency;

There is a much lower frequency of linear motifs below stingrays; and

Outline are the most frequent form below stingrays, where they are least common above (Figure 7.47).

When comparing stingrays and turtles, there are some similarities to Minyiburru and Murra Murra. Both zoomorphs are commonly superimposed by Linear Schematised and Infill Naturalistic styles, with low frequencies of superimposition over other outline motifs within the same style. This confirms that these two motifs are early in the style sequence here, however whilst turtles superimpose some figurative motifs, they do not have the wide array of motif types under them as the stingrays do. The diversity of styles seen within stingray motifs (Outline/Patterned Figurative, Dot Infill and Infill Naturalistic: see Chapter 6), combined with the diversity of motif types stingrays superimpose, suggests that stingrays – like Minyiburru – perpetuate for longer within the sequence. The mythological link between Minyiburru and the stingray clan (Chapter 3) is interesting, given the ongoing use of these two motifs within the assemblage through time. The connection between turtles and Murra Murra is not documented ethnohistorically – and this link can only be hypothesized.

![Figure 7.47 Stingrays by Motif Form](image-url)
**Marapikurrinya Sequence Revised**

McCarthy’s (1962) sequence for Port Hedland rock art is, broadly, correct (see Figure 7.48). Outline forms are amongst the oldest styles, followed by linear forms, with large infill forms being the most recent amongst the repertoire. However, McCarthy’s sequence is linear and unidirectional, and all-encompassing – he includes all outline forms within one style, and there is some confusion about some categories e.g. concentric circles in his linear class (Maynard 1979, 1988; Figure 7.48), and focus on technique confusing consistency in his stylistic classifications. Additionally, McCarthy did not recognise motifs outside of this sequence that were not diagnostic or how these were persistent through the sequence. What is clear from the current analysis of superimpositions is that some motifs appear for limited period – including those in the three styles explicitly defined. Other motifs – such as infilled human feet – are persistent throughout the sequence. Infilled human feet are a large group of motifs (n=783) with considerable internal variation in size and naturalism (e.g. morphology, number of toes).

![Figure 7.48](image-url) Comparison of McCarthy and Harper Marapikurrinya sequences with key examples

McCarthy’s sequence was not only form based, but saw technical change from abraded, through to conjoin-puncture, and pecking. However, his descriptions of these techniques are opaque (see Chapter 4), and the current fieldwork recognises that identifying technique on this rock-
type is relatively difficult, given the effects of weathering on the soft rock. McCarthy's recordings at 2 Mile Ridge, Burgess Point and Boodarie Landing (SWC5) occurred prior to the larger industrial expansions of Port Hedland: and it is worth noting that those sites, in particular 2 Mile Ridge, are significantly more weathered and impacted than the two key sites used in the current analysis. However, there appears to be relative consistency of motifs across Marapikurrinya, whilst McCarthy focussed on parts of the repertoire (i.e. Minyiburu and outline motifs) to the exclusion of other parts.

Form provides one key characteristic of stylistic change within the Marapikurrinya rock art, but is not the only characteristic.

The three explicit styles identified in this research are categorised through a combination of form, size, subject and schematisation (i.e. comparing naturalistic, representational motifs to schematised/symbol-like motifs).

1. **Outline/Patterned Figurative**
   a. Dominated by Marine Fauna, Material Culture (particularly shields, boomerangs and spear throwers, and limited numbers of spears), some Anthropomorphs and rare tracks:
      i. Includes the Minyiburu and Murra Murra as substyles – however as identified culture heroes their distinctive form within this style is not as diachronically sensitive, i.e. Minyiburu production appears to continue when other components of the Outline style have stopped being produced;
   b. Variability within this style revolves around internal patterning:
      i. A small component of this style is purely outline; and
      ii. A variety of internal patterning and designs are applied across the various motif types.
   c. Scale tends to be life size or exaggerated, with some exceptionally large figures which would have been time-consuming;
   d. Naturalism varies: some shields appear to closely resemble their physical counterparts; marine fauna however can be phantasmagorical.
2. **Linear Schematised**
   
a. Dominated by a range of barbed spears; stick figures, geometric fringes and bird tracks;

b. Characterised by economical linear form, and schematisation e.g. tracks represented through trident shaped lines;

c. Scale tends to be life size, to smaller than life-size.

3. **Infill Naturalistic**
   
a. Infill and intaglio forms;

b. Dominated by naturalistic/diagnostic macropod and bird (probable emu) tracks, with a variety of both terrestrial and marine fauna (e.g. lizards, snakes, fish and crabs) and limited Material Culture (spears) and Anthropomorphs;

c. Scale tends to be life-size.

Outside these Marapikurrinya styles it is argued that there is a range of motifs that do not share the above stylistic characteristics, and which do not appear to be diachronically sensitive. These motifs persist throughout the sequence, and are found interspersed throughout the Harris Matrices. These motifs include particularly:

- Stylised infill macropod tracks (represented by pairs of small elongated ovals);

- Infill human feet (highly variable, some fall within Infill Naturalistic where morphology and size are representational);

- Linear geometrics, particularly meandering lines and arcs.

In summary, the most dominant motif form is outline, used to create early figurative styles across Marapikurrinya, with smaller bodies of linear and infill styles superimposing these. The most recent motif groups revert from a marine focus as seen in the figurative marine fauna, and identity displays on material culture designs, to large, well-executed terrestrial fauna tracks, clearly superimposed on these preceding iconographies.

**Summary**

There is a three-phase sequence observable within the Marapikurrinya rock art repertoire. The earliest explicit style is Outline/Patterned Figurative; followed by Linear Schematised; and Infill
Naturalistic is the most recent style. These three styles focus on different themes, shown through motif choice, motif size and themes: particularly marine/coastal, themes in contrast with track (proposed arid zone) marking. These styles document a change in graphic vocabularies, with a shift away from figurative motifs – zoomorphs and material culture common within the Outline Figurative style – towards track and geometric motifs, particularly track motifs within both the Linear Figurative and Infill Mixed styles.

Importantly, not all motifs within the repertoire fit within these three styles. That is, not all infill motifs fall within the Infill Naturalistic style, and not all motifs are diachronically distinct, but are instead persistent throughout the sequence. These motifs share the form seen in the explicit styles e.g. infill macropod tracks, but lack the other attributes used to classify motifs within the Infill Naturalistic style (i.e. size and naturalism). What this may suggest is that whilst there are three identified explicit styles that fluoresce in the order stated above, that these styles are not discrete episodes, but part of a broader continuum, with a changing preference for ways of doing within that system. This is seen in the two culture heroes – the Murra Murra and Minyiburu – which fit within the earliest (Outline/Patterned Figurative) style. Being Culture Heroes, these sub-styles are constructed around specific attributes, i.e. the parallel banding distinctive of Murra Murra, and the U-shaped bodies distinctive of Minyiburu. The latter sub-style particularly appears to be less diachronically sensitive: it appears – from the above superimposition analysis, and combination of forms (outline, linear and infill) – to persevere through the sequence, where other Outline style motifs are dropping away in popularity.

Previous research into Marapikurrinya rock art, particularly McCarthy (and see Chapter 4) focussed on a very distinctive but limited proportion of this complex assemblage: the Minyiburu and Outline motifs, comprise less than ten percent of all engravings. As an art system, the Marapikurrinya assemblage utilises a combination of figurative, track and geometric vocabularies simultaneously through this body of art. What is observed here is that amongst these vocabularies there is changing popularity for ways of doing through time, seen through changing frequencies of the explicit styles. It is suggested that the reason for this complex system is that there is incorporation of local and regional level communication at the same time, as expressed through the different vocabularies and styles. It is argued here that the local Marapikurrinya style is most explicit within the figurative dominated early Outline style.

In summary, this stylistic sequence shows change through time, with a shift in focus from localised marine and seascape marking, and large distinctive culture heroes - to terrestrial and regional track marking, linking Marapikurrinya into a broader Pilbara iconographic system.
CHAPTER 8: DISCUSSION AND CONCLUSION –

MARAPIKURRINYA IDENTITY

This chapter brings together the arguments, theory and results of this research to present the many identities created and managed within the Marapikurrinya engraving repertoire.

Stylistic and temporal variability is observed within this art assemblage, and this variability marks mid to late Holocene hybridity of people across the land and sea. This can be seen in the rock art through marking of both inclusive and exclusive identities: a local coastal identity, as well as a broader arid-zone regional identity. These coexisting identities appear to have operated contemporaneously, but with changing emphasis through time, as seen in differences between the three identified styles (Outline/Patterned Figurative, Linear Schematised and Infill Naturalistic). This patterning in the engravings was explored through marine and terrestrial themes, and use of figurative, track and geometric graphic vocabularies.

Several specific observations that reflect this changing group identity are identified within this assemblage. First, the Minyiburu and other Outline/Patterned Figurative style motifs comprise a relatively small proportion (~10%) of the repertoire, and the assemblage is much more complex and heterogeneous than reported by McCarthy (1962). However, within this part of the repertoire patterned material culture provides a rich array of designs, with an observable temporal switch from wavy (D) designs, as seen on shields, boomerangs and spearthrowers, to curvilinear (A) designs seen on shields. This shift has implications for changes in group identity assertion. The conceptualisation of the rock surface itself also appears to have changed through time. During the Outline/Patterned Figurative style the rock is the surface of the water, with marine motifs ‘seen’ from above. This changes to a terrestrial surface with the anatomically correct Infill Naturalistic tracks, which appear to replicate tracks created in the fine-grained mangrove mud (see below).

- The research questions are revisited in turn: what is the Marapikurrinya Style? The stylistic similarities and differences found in this repertoire are compared to other coastal Pilbara rock art bodies, and arid zone/desert influences are discussed;
- How is Marapikurrinya identity defined using this rock art body? and;
- How do these engravings fit within the broader social and cultural context recorded through linguistics, mythological narratives, material culture and archaeological record?
The stylistic and temporal relationships of the Marapikurrinya styles are summarised, and tied to environmental change through the Mid-to-Late Holocene in northwest Australia. These environmental connections and cultural changes anchor the rock art in the recent past, and provide an active and agentive role for rock art in the movement of people and culture.

THE MARAPIKURRINYA AND KARIYARRA LAND AND SEASCAPE: WHERE AND WHEN

Archaeological and geomorphological modelling of the Northwest coast (Chapters 1 and 4: Clune and Harrison 2009; Jennings 1975; Semeniuk 1982; Ward 2013; Woodroffe et al. 1985) suggests that the Marapikurrinya estuary is a mid-Holocene feature. With sea-level stabilisation in the region around 7000 years ago this marked the end of a transitional period along this coastal plain, resulting in the current iteration of the coastline. This change would have necessitated large-scale territorial and social re-organisation, with likely associated identity changes at the local and regional levels.

The spread of Pama-Nyungan languages occurs at the same time, and it is argued that the earliest Marapikurrinya rock art (particularly the Outline/Patterned Figurative style) is a local response to these environmental and social changes.

Kariyarra country includes both a narrow coastal strip, and territorial hinterland (Tindale 1940, 1974), and the rock art is distinctly different between these two zones. This combination of both coast and hinterland fits within recent studies showing economic hybridity amongst these maritime desert communities (Veth et al. 2014, 2017). Hybridity refers to both mobility and flexibility of groups utilising multiple resources (see Chapter 4). In the Australian northwest maritime deserts this includes seasonal targeting of marine bounty and leaner – more persistent terrestrial resources across the Abydos Plain. It is proposed that the difference in styles between these locales reflects a combination of time, with older art retained across the hinterland, and marking of different localised coastal identities by smaller family group territories (recorded by Radcliffe-Brown (1913)).

Looking specifically at why the two key tidal islands in this study – South West Creek 4 and Mourambine Kariyarra 3 – are marked so intensively with rock art, there are a few environmental factors that would enable large group visits to these places. They are located at the interface of the sea and land, and take advantage of marine, inter-tidal/estuarine and terrestrial resources. Of the two islands, SWC4 has both larger ridges with more space for people and engravings, as well as a fresh-water well. These factors enhance its occupation potential compared with MK3 for longer or larger group visits.
These two islands are distinctly coastal; however, are Pleistocene-aged landforms, which prior to sea level rise would have still provided moderate elevation above first an arid coastal plain and then a delta system. The motif content of the rock art, combined with superimposition and sequencing analysis suggests that the earliest art here focuses on marine themes, to the exclusion of terrestrial themes, tying this rock art into this period of sea-level stabilisation and pre-occupation with maritime economies, which actively mark a coastal seascape identity (see David 2004).

MARAPIKURRINYA STYLE: A DISTINCT ART PROVINCE WITHIN THE PILBARA

The use of style in this thesis is targeted at recognising group identity. This is done by looking at stylistic characteristics of the Marapikurrinya repertoire, and exploring what it is that distinguishes this rock art as unique to this area. The study of the Marapikurrinya engravings has identified that form is the most distinctive stylistic marker, combined with size, level of schematisation and motif subject (see Chapter 6). As posited by Wiessner (1983), it is style that brings the social group to life, archaeologically. And in the Pilbara where there are distinct cultural and linguistic groups, style in rock art may also tell us something about cultural consistency and change.

MARAPIKURRINYA ROCK ART CONTEXT

The engravings of Marapikurrinya have been referred to as an “immense carpet” (Worms 1957:14), and some of the largest concentrations are hard to view all at once (Figure 8.1). These rich tapestries have varying densities of engraving, from single isolated motifs through to complex panels, rich in superimposition, with more than 500 individual engravings. These large engraving panels are foci along the ridgelines. They demonstrate repeated use of the same space through time via high superimposition frequencies and high stylistic diversity. These large panels have significantly higher heterogeneity than smaller panels (Morwood 1980), with higher proportions of track and geometric motifs. That these panels use the full repertoire – figurative, track and geometric – suggests functional difference within the assemblage. It is possible that they represent visitation/aggregation by the larger Kariyarra group, or other Pilbara people (i.e. Conkey 1980), which would account for the higher frequencies of track and geometric vocabularies. The interplay between track, geometric and figurative vocabularies through time is key to understanding changing group identity marking at Marapikurrinya.
HYBRID STYLES OF MARAPIKURRINYA

So, what is the Marapikurrinya style?

This research has shown that the Marapikurrinya style is comprised of multiple elements, styles and vocabularies that work together. This research has also confirmed that Marapikurrinya is a distinct stylistic province within the stylistically diverse Pilbara region (McCarthy 1962; McDonald and Veth 2009; Wright 1968). The principal new finding of this research, based on the analysis of 8320 Marapikurrinya motifs, is the dichotomy between ‘figurative’ motifs (i.e. representational motifs of humans, animals and objects) and geometric and track motifs. This is a real divide within the art body, shown through style, particularly form – and motif choice (i.e. regarding marine/terrestrial themes). However, the Marapikurrinya assemblage is a coherent art system which utilises combinations of these vocabularies simultaneously, but in changing frequencies through time.

Three explicit styles are defined by this research:

- **Outline/Patterned Figurative** is dominated by marine fauna, material culture and anthropomorphs, with very few tracks or connections to the terrestrial zone;
• *Linear Schematised* is predominantly tracks, with low frequencies of figurative motifs, and is schematised; and,

• *Infill Naturalistic* is largely a track repertoire dominated by terrestrial species (that are not represented in any figurative styles, e.g. macropod and emu). Marine/terrestrial hybridity is shown through a small suite of both marine and terrestrial faunal figurative motifs.

The Outline/Patterned Figurative style is the earliest of the three, and it is argued that this style relates to the period of sea-level stabilisation in the area. This component of the Marapikurrinya engravings represents the only component of this repertoire that exclusively demonstrates local style (Sackett 1990). It is hyper-localised: found only on the calcarenite ridges fringing Marapikurrinya (the estuary). This localised stylistic variability reflects increased territoriality in an area of resource fecundity along the Pilbara coast, set against the arid Pilbara hinterland (Harper 2016). Human figures, material culture designs, and animal motifs with varying levels of patterning are characteristic of this local style. However, the outline style is connected to the northwest through travelling mythological narratives as evidenced by the ethno-historic identification of the Minyiburu and Murra Murra figures (McCarthy 1962), and through identity-signifying material culture objects such as shields, boomerangs and spear-throwers (McDonald and Harper 2016).

Tracks are virtually non-existent within the Outline style. In contrast, these proliferate amongst Linear Schematised and Infill Naturalistic styles.

Amongst the track repertoire there is stylistic heterogeneity – some of which may relate to the bird species variability: e.g. differences between three-toed terrestrial species (emus and bustards), and four-toed intertidal wader species. However, stylistic change is also demonstrated through changes in form and use of schematisation, including the later introduction of large intaglio bird and macropod tracks. These Infill Naturalistic motifs are stylistically similar to the widespread arid-zone ‘Panaramitee’ style tracks (thought to be Pleistocene in age). However, their larger size and recent position in the superimposition sequence indicates that these are not stylistically related. This style of track is also not seen amongst recent Western Desert engraved assemblages (McDonald pers. comm. 2017). It is suggested here that this track style is a local reactivation of this arid-zone vocabulary, implemented in a Marapikurrinya specific way of doing.

The use of tracks within the two later styles moves the narrative away from the coast and associated marine themes, and instead focusses on the arid-zone landscape component of Kariyarra country, and broader land-based and regional identity assertions.
Further evidence of local identity marking can be found in two motif types that are unique to Marapikurrinya: Culture Heroes and decorated Material Culture.

Culture heroes

The two defining anthropomorphs within the Marapikurrinya Outline/Patterned Infill style are the Minyiburu and Murra Murra. Both have been interpreted as Culture Heroes, based on their morphology, attributes, occasional large size and distinctiveness. Both are found as isolated figures (rather than in scenes with other anthropomorphs). Minyiburu and Murra Murra are unique to Marapikurrinya. However, Minyiburu-like figures (Figure 8.2) have been recorded across the Pilbara from the Upper Yule (Mulvaney 2010; Wright 1968) and the Dampier Archipelago (McDonald and Veth 2006).

![Minyiburu-like figures from the Dampier Archipelago (Top row D2, O34, O37 and O40: McDonald and Veth 2006); and from the Upper Yule River (Bottom row 246, 198 and 551: Wright 1968) (Not to scale)](image)

However, these motifs (Figure 8.2) are rare and lack many key attributes of the Marapikurrinya Minyiburu such as the combination of inverted U-shaped outline body (incorporating the head and legs), infill hands and feet, arms in a variety of positions, and (usually) facial features and sexual organs (often incorporating natural vughs in the surface).

Stylistic variability within Minyiburu – including varying forms – combined with superimposition analysis (Chapter 7) suggest that whilst these figures originate during the period that the Outline/Patterned Figurative style was being produced, they persist through time when other Outline style motifs are dropping out of production. The ethnographic
association between Minyiburu and stingrays – noted in the 1950s – is interesting as like the Minyiburu, stingray motifs proliferate with the Outline style, and continue throughout the sequence in a way that other marine motifs do not.

The Murra Murra figures represent some of the largest engravings recorded across Marapikurrinya, representing a significant production time-cost (Figure 8.5, see Chapter 7). Superimposition analysis suggests both ancestral beings were produced during the earliest Outline engraving phases here, alongside marine fauna and material culture. While they appear to be roughly contemporaneous in the sequence, they do not appear to be co-associated. There is a single example where these two types are positioned close to each other on a large panel, and only one example of a Minyiburu figure superimposing a Murra Murra. Where these figures are found in superimposition relationships, Minyiburu have a significantly higher frequency of weapons (spears and boomerangs) superimposing them. The Minyiburu appear to have been actively re-engaged with through time, whether these weapons are suggesting aggression towards these figures, or otherwise.

**Material Culture**

Engraved Marapikurrinya material culture is unique in the Pilbara (see McCarthy 1961; Mulvaney 2010; Wright 1968). Shields, spearthrowers, boomerangs and axes fall distinctly within the Outline/Patterned style, and their patterned designs can be linked to material culture items recorded across the Pilbara and more widely (Campbell 1911; Cleland and Giles 1909; D.S. Davidson 1937; Elkin 1949; Petri and Schulz 1951; McCarthy 1962; Tindale 1987; Worms 1954). These distinctive designs, particularly those found on shields, mark both localised and regional group identity (McDonald and Harper 2016).

Ethnographic information and comparison with physical shields and spear-throwers (Akerman 1992; Tindale 1987; von Brandenstein 1972) suggest that the local Kariyarra design at contact/invasion was a parallel zigzag. The number of bends in the zigzag has been linked to different linguistic groups across the northwest. Shield motifs show both high levels of stylistic heterogeneity, and design consistency seen through repeated examples of these various designs, building on distinct design vocabulary (McDonald and Harper 2016). The 23 Marapikurrinya design variations suggest their use as group identifiers, rather than individual markers. Three different design forms – curvilinear, wavy and linear – are distinctly different from each other, and the dominant curvilinear designs replace the older, less common, wavy design. The earlier zigzag shield designs are generally weathered, and lack the care and intricacy seen in more recent designs (see Figure 8.3).
Figure 8.3 A curvilinear design (A2, South West Creek 4) left; and older zigzag design (C3, 2 Mile Ridge)

Spearthrower engravings have two distinctive forms: narrow parallel-sided examples and wide varieties. While this small group of motifs doesn’t offer the robust-sample size of the boomerangs or shields it does, however, suggest a link between type and design: seven out of eight of the narrow examples have parallel longitudinal lines. This design homogeneity suggests corporate group level identity marking on these narrow spearthrowers, and individual identity marking on the wide ones.

Boomerangs include examples of the fighting boomerang (wirba), and appear to be left and right handed (i.e. these are asymmetrical and the holding end is slightly longer and narrower than the forward end). The engraved motifs also include the fishing boomerang (waruwaru: see Tindale 1987): a coastal and intertidal-adapted technology. Tindale (ibid.) noted that these were marked with identifying designs, presumably so that a person could retrieve their own object once the tide goes out. Design variability in boomerangs and the distribution of popular and repeated designs is very different to the pattern seen amongst shield designs. One banded design (B-B3) dominates, representing slightly more than half of all motifs. This suggests that banding on boomerangs is the local design, and the remaining variability relates either to individual identity, as suggested by Tindale (1987), or aggregation of multiple groups, where the designs reflect different groups marking identity in this place.
When comparing shields, boomerangs and spearthrowers, two design groups are seen across the three items: longitudinal banding and concentric wavy lines. Longitudinal banding has been linked with desert shield designs (Akerman 1992), while the wavy design has no physical material culture or ethnographically recorded correlate. As this wavy design amongst shields is shown to be early in the sequence, and replaced by curvilinear designs, this identifier is argued to relate to the earliest phase of Marapikurrinya identity assertion.

It is concluded that shield design variability across the two tidal islands reflects aggregation behaviour (Conkey 1978; McDonald and Veth 2012) with groups from a broader social region. Gunn (2011) found a similar pattern in the central desert with more shield designs representing a greater complexity of ceremonies being undertaken, with shield motifs being proxies for signatures left by attendees of these ceremonies.

Following this summary of Marapikurrinya specific motifs and their involvement in marking and projecting local identity, the style as whole is now presented.

**THE MARAPIKURRINYYA STYLE**

The Marapikurrinya style includes two major graphic vocabularies: figurative, and track and geometric. The figurative components are largely found within the Outline/Patterned Figurative style (dominated by anthropomorphs – including Culture Heroes – marine fauna, and material culture with complex and repeated designs) making up the early part of the sequence that speaks to the development of a seascape identity. Within this style, different types of identity marking have been identified: corporate group identity through repeated designs on material culture; local and individual identity seen on heterogeneous boomerang and spear thrower designs (including type A); and hyper-localised representations of culture heroes identified historically with long-ranging mythological narratives.

This earlier style represents around 10% of the engraved assemblage. It is equated with sea-level stabilisation (c. 7000 BP) and the establishment of Marapikurrinya as a coastal locale, and it is enmeshed within a broader and persistent arid-zone system. The efflorescence of subsequent styles (Linear Schematised, then Infill Naturalistic) focus more closely on regional and terrestrial themes.

With the phasing out the Outline/Figurative style the level of schematisation in the Marapikurrinya art body increases. The Linear Schematised style demonstrates a rapid decrease in time-cost for engraving production. The switch to Infill Naturalistic style shows a modest time-cost increase. This later naturalistic style includes macropod and emu tracks in anatomical detail in such as might be left by these animals walking through the fine-grained
mudflats surrounding these tidal islands. This style includes elements of both land and sea, with the inclusion of marine and terrestrial fauna within the figurative component of this style. This interrelationship between figurative motifs and the track repertoire is argued to reflect a hybrid maritime desert society of northwestern Australia (see Veth et al. 2014). This hybridity also relates to the inter-relationship between rock art vocabularies and themes, which are argued to reflect the marking of inclusive and exclusive identities. The early seascape, figurative-dominated and outline style distinguishes this rock art body from other Pilbara repertoires, marking and emphasising territorial, localised, exclusive identity. The movement away from Outline/Patterned Figurative engravings to schematised then naturalistic motifs, increased frequency of tracks, and the inclusion of both marine and terrestrial themes within these later styles, indicates inclusive, regional identity, which shifts the marking focus away from the hyperlocalised coastal hub, to a hybrid marine/coastal/terrestrial identity.

These stylistic fluctuations observed within the assemblage reflect ongoing adaptation through time, and the modification of local identity with changing territorial and social pressures.

**MARAPIKURRINYA SCENES AND SUPERIMPOSITIONS**

The significantly high number of superimpositions across the whole suite of engravings here requires further discussion, with 2062 (24.8%) motifs involved in a superimposition. This frequency varies across the islands and within motif classes. Across all motifs, the highest recorded superimposition rate recorded was 37.1% for panel M14-1, and figurative motifs were noted to have a higher superimposition frequency than tracks and geometrics (43.3% compared with 21.7%). These figures indicate selection by people of where and what is being superimposed, recognising that whilst engraving is near-continuous across rock surfaces on both SWC4 and MK3 (see Chapter 6), there are sections of the ridgelines with relatively little marking.

As outlined in the methodology, assessment of superimpositions in this thesis was not targeted solely at resolving sequencing, but to investigate superimposition as a means of active meaning creation (Blundell et al. 2010). This approach aimed to interpret what and where superimpositions occur, to understand artists’ decisions in placement and socialisation of these places.

On the largest and most superimposed panels, there is repeated deliberate ‘partial superimposition’ (Domingo-Sanz 2008:106) of older styles by newer ones. However, the underlying motifs are still visible and interpretable, and not obliterated. Whilst it is difficult to completely erase a previous engraving (Clegg 1987), these partial superimpositions support the
argument that the changes in style reflects changes in the information being conveyed by these styles, but this may reflect functional change, as opposed to social group change. That is, as found in Levantine contexts (Domingo-Sanz 2008:122), the artists are aware of the previous rock art, and the new layers of marking are used functionally to change and differentiate their identities. This retention of older motifs, below newer styles, also fits with the presence of persistent motifs that are consistent throughout the sequence, again suggesting social continuity.

MARAPIKURRINYA IDENTITY THROUGH TIME

This research has found that within the Marapikurrinya art body there is a continuum of practice, with three explicit styles and content preferences fluorescing through time, from the mid-Holocene to recent past. This begins with Outline/Patterned Figurative, is followed by Linear Schematised, and ends with the Infill Naturalistic style.

Superimposition analysis using Harris Matrix Composer on four large complex panels enabled assessment of the superimposition relationships demonstrated by these identified styles, and tested McCarthy's (1962) sequence. High frequencies of superimpositioning, involving c. 25% of the recorded assemblage, were recorded. Sequences involving between two and up to six- art events were documented. McCarthy's sequence is upheld for most motifs, contradicting Maynard (1979, 1988) and Rosenfeld's (1988) arguments that there was no stylistic change within the Marapikurrinya repertoire. However, the hierarchical and exclusive nature of his sequence ignores particular motifs (such as non-diagnostic macropod tracks or human feet recorded beneath outline figures) that do not 'fit' the identified transition from outline to linear to infill. This research has found that some motifs within the repertoire are not diachronically sensitive. These motifs have been labelled persistent, and it is argued these represent the non-iconological portion of the broader repertoire, which is not being used to actively mark identity through style.

It has been argued that Marapikurrinya engravings are a mid-to-late Holocene phenomenon. The earliest art here is thematically marine-dominated (e.g. fauna and material culture), to the exclusion of terrestrial themes (e.g. fauna and tracks). The marking of a highly localised maritime identity is a predictable response to the reduction of land-based territory and establishment of intertidal and mangrove resource systems, and the associated social stresses related to territorial realignment post sea-stabilisation.

This early marine art is not being created within a social vacuum however, but within a longer and persistent tradition of geometric and track marking across the Pilbara that extends back
into the Pleistocene (Franklin 2004; Maynard 1979; McDonald and Veth 2009). It is into this context of rock art making that the three explicit Marapikurrinya styles fit, and it is suggested here that persistent non-diagnostic motifs recorded within this art system speak to this regional context and history of art production.

The presence of intaglio tracks in the most recent Infill Naturalistic style has been confirmed by this research. These motifs caused much of the dissent amongst McCarthy’s critics – as these appear similar in morphology to those recorded at classic Panaramitee sites (Maynard 1979, see responses to McCarthy in RAR 1988). The size of these motifs generally exceeds the largely smaller classic Panaramitee infill track motifs (excluding Sturt’s Meadows: Clegg 1987), and is more akin in appearance and technique to the Weaber track recorded in the Northern Territory (Ouzman et al. 2001). These large infill tracks also contradict a common pattern seen in Australian rock art (as observed by Mulvaney 2010; Ross 2013; and Wright 1973) that older engravings are deeper than newer ones. Relative depths were recorded as a variable for all motifs, and when looking specifically at this style of track, these are moderate to deeply pecked engravings.

The transition away from figurative motifs towards track motifs suggests either changing engraving preferences influenced by regional trends, or a changing focus for the stories being told in the rock art. Such a shift towards terrestrial-based tracking reflects active identity marking as arid-zone people, communicating within a known regional system. This transition to infill marking may well have occurred within the last 1500–2000 years, alongside the movement of desert peoples and their culture across the northwest and into the Pilbara (see Chapter 4).

MARAPIKURRINYA, THE PILBARA COAST AND THE WESTERN DESERT: STYLISTIC CHAINS OF CONNECTION

The track and geometric repertoires are expanded on here, to further refine how Marapikurrinya fits within the arid zone.

INTERIOR FISSIONING OR ARID-ZONE COALESCENCE?

Recent archaeological research across the Northwest (e.g. Clune 2002; Morse et al. 2014; Veth et al. 2014) explores resource hybridity through the LGM and into the Holocene. Site use during this time period indicates hypermobility and flexibility as advantageous through use of both hinterland/terrestrial and coastal resources. The Marapikurrinya motif repertoire includes widespread desert motifs comprising concentric circles and spirals, a possible threadcross (Worms 1954), tracks in general, and large infill/intaglio emu and macropod tracks in particular. This perceived desert influence is discussed here.
Tracks and connections with arid Australia

The distribution of figurative faunal motifs (Wright 1968) across the Pilbara is a useful indicator for characterising the Marapikurrinya rock art (see Chapter 4). The absence of macropods and emus within the Marapikurrinya repertoire is in stark contrast to the other Pilbara rock art locales: both those on the current coastline, and across the hinterland (Figure 8.4).

Figure 8.4 Terrestrial and Marine Figurative motifs across the Pilbara (Base map: Wright 1968)

Wright (1968) identified infill macropod motifs at the Upper Yule, Nunyerry Creek, Black Hill Pool, Cooya Pooya and Chiratta, as well as outline macropod styles at the Upper Yule, Hamersley Station and Cape Lambert (on the coast between Depuch Island and Murujuga). Emus were recorded in both infill (Chiratta and Black Hill Pool) and outline styles (Juna Downs, Hamersley Station and the Upper Yule). Other terrestrial motifs not seen at Marapikurrinya include dingoes (Hamersley Station and Black Hill Pool), echidnas and marsupial mice (Upper Yule).

Marine fauna is recorded in the Pilbara hinterland by Wright (1968), with an outline turtle and infill crab recorded at Cooya Pooya, inland from Cape Lambert and the town of Roebourne.
Stingrays and turtle engravings were also recorded at Gallery Hill, approximately 100km inland from Marapikurrinya (McCarthy 1963) and the current coastline.

The absence of macropods and emus from the figurative art at Marapikurrinya is significant, and reinforces the difference between figurative and track vocabularies here.

In contrast, and as highlighted in Chapter 4, whilst track and geometric repertoires have been identified across the Pilbara, their stylistic variability has not been addressed. Like with figurative marine and terrestrial motifs, there is no clear pattern between coastal or inland locale, and presence and frequency of track motifs. The highest frequencies he observed were at the Upper Yule, in the Pilbara hinterland, and at Sherlock Station, near the current coast. Tracks were also observed in lower frequencies from Cape Lambert, inland into Juna Downs, Wright’s most inland study area.

The Marapikurrinya track repertoires are dominated by macropod and bird tracks in Linear Schematised and Infill Naturalistic styles, with smaller numbers of insect, lizard, dingo and turtle tracks. Human tracks occur in the greatest frequency of all tracks, and these will be discussed below in relation to mythological narratives.

Track motifs fit into the broader arid-zone track and geometric vocabulary in use across the Pilbara, into the Western Desert and beyond, and are argued here to mark this regional identity.

Another way of examining these track motifs is a conceptual change in the perception of the rock surface. Within the Outline/Patterned style, the motifs are largely marine themed, and are largely seen from above, as if looking through the surface of the water. This use of the rock surface changes through the styles, with the movement away from marine content to terrestrial, particularly amongst the track repertoire. This change is seen in a more pronounced way within the Infill Naturalistic style, where the rock surface has conceptually solidified into a land surface, covered in anatomically correct tracks, as would be seen across the surrounding mudflats. This perception retains a transition at Marapikurrinya from the sea to the land.

Reinforcing this transition from coastal to terrestrial marking, the Infill Naturalistic emu tracks are often in deliberate superimpositions of previous styles including marine fauna generally, and turtles in particular. It is suggested here that the change in focus away from marine fauna and the use of figurative motifs to convey information, suggests a terrestrial and inland-looking focus. This can be interpreted as reflecting the pressure of desert influence moving into the Pilbara, or alternately a change in identity marking, focussing on the broader regional style to de-emphasise difference, embrace homogeneity and ensure social stability (Hegmon et al. 2016).
(IN)CONGRUENCE OF ROCK ART, LINGUISTIC MARKERS, MYTHOLOGICAL NARRATIVE AND MATERIAL CULTURE

The combined cultural components of linguistics, mythological narrative and material culture contribute to better understanding the complexities of Pilbara group identities. These factors provide additional contextualisation to sea-level change, as potential social drivers for Marapikurrinya peoples.

Linguistics of the Pilbara and connections to rock art

Pilbara language speakers identify both with the language and the place in which it is being spoken, i.e. there is a correct language which belongs to a place, rather than to an individual speaker (Dench 2001). This pattern has correlates with rock art styles (see Chapter 4), where particular styles can be seen as belonging to specific places. As rock art is permanently fixed in place however, it has perpetual connections to place regardless of the movement of people (and their languages) through time.

Marapikurrinya rock art allows us to understand how style might function within a broader cultural and linguistic region like the Pilbara. The Marapikurrinya styles are limited to the coastal country of the Kariyarra language area. There are a limited number of hinterland rock art sites in the Kariyarra bloc and these reveal distinctly different rock art styles, on different geologies and distinctly different landforms. These inland engravings focus on tracks, terrestrial fauna, and different ways of depicting anthropomorphs than what is found on the coast, speaking to the broader Kariyarra group identity. The Marapikurrinya Outline style speaks to a time when coastal Kariyarra people exclusively marked their connection to that place. This style may represent a different language group distribution to that recorded at European contact, potentially in line with the development of proto-Pama-Nyungan, preceding the establishment of the Ngayarda language bloc.

Engraved Mythological Narratives?

Rock art can act as a fixed referent within a cosmological or Dreamtime setting, connected to songlines, rituals and mythologies (Palmer 1977; Tonkinson 1978; see Chapter 3). The relationship between rock art and mythological narrative is strong, and engravings are often seen to embody Ancestral Beings – or indeed to be transmogrifications of Ancestral Beings (McDonald and Veth 2013). The Minyiburu and Murra Murra engravings were interpreted as representing named Culture Heroes associated with specific stories by Kariyarra and Nyamal informants in the 1950s (McCarthy 1962). The recurring themes of the regional mythological narratives are of ancestral beings who move through the landscape, and who chase or replace
other ancestral beings (see Chapter 3). Murra Murra is said to have been driven out of the region by newcomers, including the Two Men, who came into the Pilbara out of the Western Desert from the north, but who are not represented or linked to any figures within the Marapikurrinya rock art. McCarthy (1962) suggested new mythologies were brought into Marapikurrinya in historical times, with the movement of large numbers of Nyangamarda speakers into the town, and so the mythological narratives spoken of at contact may have little relevance to the mid-Holocene depictions in the Marapikurrinya rock art. How these engraved motifs fit within the details supplied in recorded mythological narratives was tested by this research.

Superimposition analysis suggests that Minyiburu figures continue into a later phase of engraving than the Murra Murra (although there is only one direct superimposition involving these two Beings).

There is a general lack of superimpositioning over the Murra Murra figures. This is particularly noticeable on panel M14-2, where the very large Murra Murra has only three small motifs superimposed over it. This stands in stark contrast to examples of superimposition of Minyiburu motifs where multiple spears can be found over these figures (see Figure 8.5).

The recorded narratives indicate that the Minyiburu were a group of women, and Murra Murra was a man. Gender information collected for the culture heroes indicates that the Minyiburu motifs are more commonly engraved with female genitalia. The engraved Murra Murra figures, however, have almost equal representation of male and/or female genitalia. While a high proportion of Minyiburu engravings are females, these are almost always depicted as solitary figures and not engraved in groups (as described in the mythological narratives), so are not seen to match descriptions of the seven sisters/group of women. Additionally, whilst a few are superimposed by shields, these motifs are not commonly associated with boards or other ritual paraphernalia as described in recorded mythologies.

Captain George and Njerburg, McCarthy's (1962) Kariyarra informants, said that the Minyiburu were the stingray people. Stingray and stingray liver motifs across Marapikurrinya are prevalent. The presence and use of different styles, and superimpositions of stingray motifs, suggests their ongoing creation throughout the early and middle phases of engraving here, in a similar time frame to the Minyiburu.
A notable feature of these culture hero motifs is their spatial isolation to the Marapikurrinya harbour. Neither Minyiburru nor Murra Murra figures can be seen to travel the distances the mythological narratives with which they are associated. The identification of both motifs within the early and middle phases of engraving at Marapikurrinya suggests that these styles could have been developed thousands of years ago, and may represent different culture heroes to those identified in the 1950s. The isolation of these motifs to the Marapikurrinya harbour suggests that they do not represent the long-ranging culture heroes they were identified as.

**Material Culture designs**

The large body of engraved material culture objects marked with known Pilbara material culture designs that reveal much about identity marking. There is some incongruence between formats (i.e. variance between recorded designs on engraved and physical material culture), but these motifs can be seen to reflect a localised coastal identity marking. The earliest phase of engraving reveals use of specific designs which project and mark identities. The large rock art

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**Figure 8.5** Multiple long spears superimposed over Minyiburru on Mourambine Kariyarr 3, and one small spear over Murra Murra on South West Creek 4
sample reveals a significantly broader array of designs than is found among the limited numbers of (more recently) collected shields.

Marapikurrinya identity is revealed within a broader cultural structure: Marapikurrinya rock art styles can be understood within the Pilbara context by combining information about mythological narratives, linguistics, and material culture. This identity is now tested against the Marapikurrinya predictive model, as proposed in Chapter 4.

**MARAPIKURRINYA PREDICTIVE MODEL**

This research has focussed on how stylistic changes in the rock art assemblage can be aligned to environmental, climatic and social changes. It has explored whether the Marapikurrinya engraved repertoire is:

- A distinct rock art style that reflects a local group negotiating territorial boundedness and social strategies to exclude other groups; or,
- A rock art style which reflects hybridity and hyper-mobility of people and inclusive social connections across the Pilbara.

Three proposals were developed in Chapter 4:

1. **With sea level stabilisation in the region from 9-6000 years ago, associated rapid population expansion, increased sedentism, and the spread of Pama-Nyungan languages, does the Marapikurrinya rock art assemblage evidence a heterogeneous localised style, marking territory (exclusion)?**

The Outline/Patterned Figurative style is confirmed as being a heterogeneous Pilbara style, and it is the earliest explicit Marapikurrinya style. It includes a distinct maritime repertoire, fitting this time period of sea-level stabilisation, includes identity-laden material culture, and two distinctive anthropomorph types: Minyiburru and Murra Murra. This style reflects territorial organisation and bounding behaviour.

2. **With increasing aridity and climatic instability from 4500-2000 years ago is there change in rock art production, reflecting increased mobility and regional interaction, including aggregation of people at Marapikurrinya?**

The proliferation of the Linear Schematised style is seen as reflecting increased stress (i.e. time pressure) and a change in motif focus. There is both inclusive and exclusive marking in this style which includes the proliferation of barbed spears (as a sign of aggression and evidence for replacement of Minyiburru and marine fauna in the Outline style). The increase in track motifs
reflects increasingly inclusive broad-based style-use with the Pilbara and arid zone more generally. The terrestrial track repertoire incorporating mixed economies and broader regional identity indicates longer distance chains of connection across the Pilbara and into the Western Desert, and the interplay between coastal and arid-zone communication systems.

3. With climatic amelioration and population increase in the last 2000 years, does Marapikurrinya rock art reflect interaction between neighbouring groups, and/or aggregation reflecting seasonal abundance of seasonal use of this place, as reflected in stylistically heterogeneous art?

The continued use and marking of large panels into the most recent Infill Naturalistic style suggests larger group aggregations through presence of the full suite of motif types. This is supported through other archaeological material: for example, stone arrangements on engraved boulders, as well as individual placed engraved boulders, are located in proximity to these areas of densest engraving. In contrast, grinding patches are not closely associated with these same areas, and are less common on the larger of the two islands (SWC4), where the largest and densest engraving panels are found.

The Infill Naturalistic style with an increase in time-cost for engravings and a change in subject focus from purely marine to marine/terrestrial themes suggests a switch to use of this place during times of seasonal abundance but with a continuing interest in the broader regional arid-zone economies.

The identified Marapikurrinya rock art styles can be aligned to the regional predictive model, based on archaeological evidence as social responses to regional climatic and environmental changes. Changes in stylistic information in the rock art can be seen to reflect changes in group bounding to bonding behaviours.
CONCLUSION

Holocene intensification in the Pilbara, like elsewhere in Australia, is shown by a diverse array of adaptations. This is particularly evident in the development of a hyper-localised Marapikurrinya style, as verified through stylistic and superimposition analysis of 8320 engravings. This style province is geographically confined to the calcarenite ridges fringing the harbour and immediate coastline.

The Marapikurrinya repertoire contains several complimentary graphic vocabularies: a local figurative style dominated by distinctive anthropomorphs, marine fauna and material culture, and more homogeneous regional track and geometric vocabulary, with a strong terrestrial focus, that stylistically ties this place within the broader Pilbara. The Marapikurrinya figurative assemblage sets it apart from the rest of the Pilbara, while the track and geometric repertoires connect it to other art bodies in this region.

The Outline/Patterned Figurative style records the development and active marking of a seascape identity, and the establishment of Marapikurrinya as a coastal locale. The Linear Schematised style records regional stresses, with decreased time-cost spent on engravings and an influx of tensions as marked by the explosion of barbed spears. The focus shifts away from the sea, and towards the arid hinterland. The Infill Naturalistic style marks Pilbara hybridity, with both marine and terrestrial fauna, and use of both the figurative and track vocabularies with increased time-cost spent in engraving activity. The shift away from exclusive Marapikurrinya identity represents a shift towards a more inclusive regional identity.

The Marapikurrinya assemblage shows how style can mark both local exclusive identity, and adapt towards marking regional identity. The largest panels record this palimpsest of stylistic communication through time. Style has been used to emphasise and de-emphasise difference through the mid to late Holocene, creating and maintaining hybrid identities that negotiate a dynamic period of human history.


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APPENDIX 1: REGISTERED ROCK ART SITES

A review of the Western Australian Department of Aboriginal Affairs (‘DAA’, formerly the Department of Indigenous Affairs) register was undertaken in 2013 to assess all recorded rock art in and around Port Hedland. Thirty-four separately registered sites were identified (Table 1) and each site, or site complex is summarised here.

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**Table 1** Known Rock Art sites across the Port Hedland region

*Burgess Point*

Burgess Point (P00549/11632, including Protected Area 26, also known as Kariera Island [McCarthy 1962], and Stingray Creek) is located south of the Port Hedland township (see Figure 1), southeast of 4 Mile Ridge. The site comprises engravings, mythological connections, stone arrangements/thalu, grinding patches, shell midden, and PAD.

The DAA register divides this place into four sites (see Figure 1):

- SC-08-01: Engraving Site;
- SC-08-02: Engraving Site;
- SC-08-03: Midden Scatter;
- SC-08-04: Engraving Site (corresponds with McCarthy’s recording ‘Kariera Island).

These various site designations create some confusion, as site boundaries are not coherent between McCarthy’s recording (1962), DAA designations, and that provided by Jackson and Mitchell (2008).

As seen in Figure 1, the calcarenite ridges at Burgess Point run northwest/southeast, converging at their southeastern end. These ridges are fringed by mangroves to the south, and bordered by tributaries of Stingray creek along the southern and most of the northern side, while being accessible by land even at high tide overland, providing an ideal combination of high ground with maritime resources. Smaller outcrops of calcarenite to the north of the main ridges also include engravings and other archaeological material (indicated by SC 08-01 and SC-08-02). Consulting reports indicate that PAD at this site may contribute information regarding the age of coastal resource exploitation (Jackson and Mitchell 2008).
Figure 1 Aerial view of Burgess Point (approximate sites - pink outlines), ridges indicated (transparent yellow) (Image: NearMap)

In McCarthy’s comprehensive report, Burgess Point (SC-08-04) is included as site #3, and called Kariera Island (see Figure 3). He notes that there are three ridges, which are visible in Figure 1 and 2.

Figure 2 McCarthy 1962: Figure 46b; Annotated sketch of ‘Kariera Island’: triangles are Minjiburu engravings, circles are Thalu stone heaps.

McCarthy describes the site as follows:

“A broad tidal flat, covered in parts by mangroves, separates the town from Kariera Island, on which two parallel ridges from one-and-one-half to two miles long, and a third one-half mile long, are separated by spinifex grass and tidal flats. This island can be
visited by landing from a boat along the northern or western sides, or by walking across the tidal flat from the Four Mile end. The natives visit the area for fishing by walking across the mud and mangrove flat from the One and Two Mile camps. These ridges all bear very well preserved displays of engravings which include the pecked goannas, bird and fish, a remarkable series of turtles, the whale, elaborate design, and several Minjiburu figures. A series of Thalu heaps of stone were located on the furtherest west of these ridges” (1962: 8) (See Figure 3).

**Figure 3** ‘Thalu’ from Burgess Point, as recorded and drawn by McCarthy, Figure 1:c-e (1962)

*Four Mile Engravings*

Four Mile Engravings (P07389/731) were probably once part of the 2 Mile site complex ridge line, but have been impacted by the development of the town and associated infrastructure. The site was recorded by Warren (1995) and covers an approximate area of 700 by 40 metres and comprises engravings, *Anadara granosa* shell midden, grinding patches, with another site adjacent also known as Four Mile or Puriyakanya, a named freshwater source that comes from a Ngarla song about Port Hedland, also recorded as being used by Afghan cameleers. The well is sung about in several local languages. This well was also a temporary site of the 1946 Strike camp, before they moved to the 12 Mile site (Warren 2001).

The engravings are of low density, scattered and largely weathered, but show various styles of engraving and motif choice (e.g. see Figures 4 and 5).
**Figures 4 and 5** Left: Grinding patch and parallel pecked lines; Right: Intaglio pecked sitting macropod and arc (image – Leslie Zubieta)

South West Creek 1-7

The South West Creek sites are located west of the Port Hedland township around Salmon/South West Creek. All sites are located on and around available calcarenite ridges, with rock art present in varying densities and stylistic diversity. Associated archaeological material also varies between sites, and like much of the Port Hedland harbour it is argued that these places are interrelated and form a larger site complex.

South West Creek 1, 2 and 3 are grouped under the one DAA site card (P0088), and recorded as a mythological and camp site with engraving and shell midden, and as containing a water source. The two largest sites (SWC4 and SWC5) have received the most previous attention: South West Creek 4 was recorded as a ceremonial and mythological site by Kingsley Palmer in 1975; and South West Creek 5

Louis Warren reviewed this site complex between 1995 and 2001, as a result of a proposed Hot Bricketed Iron Plan within the Boodarie Station pastoral lease, by BHPBIO (1995, 2001), during which process SWC6 and SWC7 were identified and recorded.

South West Creek 1

P0088

South West Creek 1 covers an area approximately 350 m x 100 m on an east-west running ridgeline. Warren (1995: 8) notes that while the ridge itself is prominent, there is generally low exposure of limestone. Engravings are scattered along the length of the ridge, with the largest concentration of motifs found on a panel towards the western end.
This site includes one interesting probable anthropomorph figure, unique amongst recorded motifs in Port Hedland, with stylistic similarities to Upper Yule engravings (Figure 6; see Wright 1968).

South West Creek 2

P0088

South West Creek 2 covers approximately 800m x 30m, along a generally low (2-2.5m elevation) ridge (Warren 1995). Isolated engraving and shell material are scattered across this area. The engravings are found in two main concentrations, one towards the eastern end over approximately 180m x by 15m, and a lower density concentration located on the western half of the ridge, covering an area approximately 200m x 10m.

A range of motif types and techniques can be found here, including a Minyiburu, stick figure, patterned boomerang composition, intaglio ovals and human footprints. The majority of motifs are weathered.

South West Creek 3

P0088

South West Creek 3 covers approximately 360m x 120m, across two parallel ridgelines with a large area of low-lying sandplain between them (Warren 1995). Features include engravings, lithics and Anadara granosa midden and scattered baler shell. Both engravings and midden material are discontinuous across the area, and during field inspection a hammer stone and large basal grinding stone (Figures 7 and 8) were recorded in separate unrelated locations.
The site is impacted upon by a vehicle track that cuts through the ridge, through the main concentration of engravings and midden material.

Of the South West Creek sites (P0088) 1-3, this site is the largest with the most complex and diverse array of engravings, with multiple anthropomorph types, tracks, footprints, complex geometrics, material culture (including a ‘Kariera’ shield) and possible compositions (Figure 9).
South West Creek 4

P0090/12071 - Protected Area 25

This site was recorded by Kingsley Palmer in 1975, for the Department of Aboriginal Sites (now DAA), and was first reported by D.F. Rice in 1974. SWC4 is described as unlike other Port Hedland sites, based on its undisturbed nature: "a unique example of [a] rock art site still within its archaeological context" (DAA Site Card).

The site complex covers the entire tidal island, above the fringing mangroves covering an area approximately 3200m x 850m, with a maximum elevation along the ridgelines of approximately 9m. This site is a Protected Area under the WA Heritage Act 1972.

The site was initially recorded as a ceremonial and mythological place, and campsite, with extensive midden and engraving material, stone arrangements, artefact scatters and PAD. Midden material is recorded as predominantly bi-valves, with low densities of gastropods, Melo spp and Syrinx aranus, and species selection between middens was noted, with the notable absence of oyster across the island. Midden material was recorded as dramatically increasing in density around ridges and adjacent lowlands where engravings are found, and more commonly on the northern side of limestone ridges (Warren 1995: 9). A fresh water well, or soak, is located along the main southern ridge, approximately central, and in close association with areas of dense engraving.

Warren states there are two main engraving concentrations, one 1500m x 100m, to the south of the island, and one 800m by 100m, to the north of the island, and both engravings areas are described as very significant (Warren 1995). Engraving density was recorded as variable, from low to high, with the northern engravings given the epithet of 'lesser'. Two stone piles are also mentioned in the site card, located on one ridge approximately 400m west of Salmon Creek (also known as South West Creek).

South West Creek 5

P0091

The Old Boodarie Landing site was first recorded by McCarthy in 1962 as site 4 (1962: Figure 1A), although this was mapped incorrectly in his figure. The site covers and area approximately 260m by 60m, and comprises discontinuous engravings and shell midden, predominantly of Anadara granosa with small numbers of Terebralia spp (Warren 1995). A few standing stones were noted during field inspection, wedged into the solution holes within the calcarenite.
McCarthy notes that during the 1950’s the engravings were in excellent condition (1962: 8). Engravings are found in a series of concentrations, with the main concentration approximately 100m by 10m from the boat access track which cuts through the ridge, to the west. Density of engravings is variable, with areas of high density, and Warren (1995: 11) describes the motif range as greater than at sites SWC1-3. Smaller areas of engravings are associated with midden deposit.

Extensive graffiti is seen at this site around the boat ramp, comprising names, initials and dates. Some of this graffiti is located over engravings.

**South West Creek 6**

South West Creek 6 is a small site covering c. 130m by 60m, comprising discontinuous engravings and scattered midden, which extends onto the salt and mudflats at the southern end of the ridge (Warren 1995). The site is located to the east of SWC3 and is known as Field Site 2 in Warren’s report (ibid.). The main engravings are generally weathered and cover an area approximately 60m by 15m on the northern margin of the ridge (e.g. Figure 10).

![Figure 10](image)

**Figure 10** Example of a SWC6 engraving with scattered *Anadara spp.* shell (Photo – Leslie Zubieta)

**South West Creek 7**

South West Creek covers approximately 800m by 100m and is bordered to the immediate north and east by mangrove-lined tidal creeks. The site is called Field Site 1 in Warren’s report, and is directly south of SWC4. The site comprises a large and discontinuous engraving and midden
site, with associated PAD. The midden material is noted as the most extensive and largest part of the site, from the highest point on the limestone ridge, continuing approximately 240 metres to the east. Further to the east is mounded midden, thought to have considerable vertical development.

The motifs vary from weathered to more fresh-looking, and include outline hands, material culture including various spears and patterned boomerangs, human footprints, turtles and insect tracks.

Two Mile Ridge

The original Two Mile Ridge (Figure 11) runs though the township of Port Hedland, from the original Port Hedland jetty at the east end of the township, running approximately parallel with Wilson Street and the rail line (i.e. also built on the highest elevation above the mudflats) for approximately 6 kilometres, around the Six Mile Creek turnoff from Wilson Street (Warren 2001: 16). The site itself is an extensive occupation and engraving site located on a wide, long and relatively low ridge, and includes a freshwater well around the 2 Mile mark from the original jetty, shell midden, dominated by Anadara granosa, with some fragmented Baler and Conch shell, probably Tahu stone arrangements, grinding and some scattered lithics.

![Figure 11 Port Hedland township with approximate location of original ridges (pink)](Base image – NearMap)
Early recordings along this accessible ridge were discussed earlier (Basedow 1925, Petri and Schulz 1951, Tindale 1987), in sections of the ridgeline that no longer exist. McCarthy (1962) recorded large sections of the ridge line, from the port through to 'Four Mile'.

The original Two Mile Ridge site has been severely impacted by the development of the Port Hedland township, associated development and infrastructure around the mining industry in the region. As a result of these impacts, the ridgeline is divided into a number of smaller sites, labelled and described by Warren (2001).

A section of the Two Mile Ridge (P00219) is a designated Protected Area (PA) under the Aboriginal Heritage Act, No. 2 (this was the second Protected Area declared within Western Australia), as well as a Class A Aboriginal Reserve (No. 21448). This area covers a section of the ridge with a dense cluster of engravings, referred to by McCarthy as the 'main concentration' (Warren 2001: 16). Part of this PA has been fenced, with signage and a boardwalk erected, however all are currently in disrepair, and the placement of the fenceline does not align with the PA boundary, but rather the densest section of engravings.

McCarthy’s 1958 (1962) recording remains the most comprehensive record of 2 Mile Ridge. He took a photo of every motif for 120 feet around the 2 Mile well, and illustrated a range of them. While these illustrations are largely preserved in his 1962 report, along with a couple of these photos, the bulk of the recordings cannot be located. His report indicates 6916 motifs were categorised by motif type and technique along the length of the ridge, including: arcs, banded designs, bars, barred ovals, bird tracks, boomerangs, bullroarers, circles, crosses, geometric designs, echidnas, echidna tracks, feather plumes, fish, goannas, axes, anthropomorphs, kangaroo tracks, marina fauna, ‘Minjiburu spirits’, plants, pubic fringes, sacred boards, linear designs, shields, spears, spearthrowers, sword clubs, turtles and stingrays. From this large dataset, utilising superimposition and broad technique classifications, McCarthy developed a four-phase sequence for the Port Hedland repertoire that he argued could be applied across all Australian engraved rock art.
APPENDIX 2: HUMAN RESEARCH ETHICS OFFICE
Dr. Josephine McDonald  
School of Social Sciences  
MBD1 M157  

Dear Doctor McDonald,

**HUMAN RESEARCH ETHICS APPROVAL - THE UNIVERSITY OF WESTERN AUSTRALIA**

Centre for Rock Art Research and Management; Archaeology

**Student(s): Samantha Harper - Ph.D.**

Ethics approval for the above project has been granted in accordance with the requirements of the National Statement on Ethical Conduct in Human Research (National Statement) and the policies and procedures of The University of Western Australia. Please note that the period of ethics approval for this project is five (5) years from the date of this confirmation. However, ethics approval is conditional upon the submission of satisfactory progress reports by the designated renewal date. Therefore, initial approval has been granted from 14 March 2014 to 01 April 2019.

You are reminded of the following requirements:

1. The application and all supporting documentation form the basis of the ethics approval and you must not depart from the research protocol that has been approved.
2. The Human Research Ethics Office must be approached for approval in advance for any requested amendments to the approved research protocol.
3. The Chief Investigator is required to report immediately to the Human Research Ethics Office any adverse or unexpected event or any other event that may impact on the ethics approval for the project.
4. The Chief Investigator must inform the Human Research Ethics Office as soon as practicable if a research project is discontinued before the expected date of completion, providing reasons.

Any conditions of ethics approval that have been imposed are listed below:

**Special Conditions**

None specified

The University of Western Australia is bound by the National Statement to monitor the progress of all approved projects until completion to ensure continued compliance with ethical standards and requirements.

The Human Research Ethics Office will forward a request for a Progress Report approximately 60 days before the due date. A further reminder will be forwarded approximately 30 days before the due date.

If your progress report is not received by the due date for renewal of ethics approval, your ethics approval will expire, requiring that all research activities involving human participants cease immediately.

If you have any queries please contact the HREO at hre@research.uwa.edu.au.

Please ensure that you quote the file reference – RA/4/164418 – and the associated project title in all future correspondences.

Yours sincerely,
Our Ref: RA/401/6418

Professor Josephine McDonald
School of Social Sciences
MEHR, 1027

Dear Professor McDonald,

HUMAN RESEARCH ETHICS OFFICE – ETHICS APPROVAL RENEWED

Centre for Rock Art Research and Management: Archaeology

Student(s): Samantha Nicole Harper

Thank you for submitting your Progress Report for the above project. The report is satisfactory and ethics approval for the project has been renewed.

You will receive a request for your next progress report approximately one month before the next renewal date of 01 April 2016.

If you have any queries, please contact the Human Ethics office at humanethics@uwa.edu.au.

Please ensure that you quote the file reference - RA/401/6418 — and the associated project title in all future correspondence.

Yours sincerely,

Dr. Carol Li
Manager, Human Ethics
Our Ref: RA/41/6418

22 March 2016

Professor Josephine McDonald
School of Social Sciences
MELP M237

Dear Professor McDonald,

HUMAN RESEARCH ETHICS OFFICE – ETHICS APPROVAL RENEWED

Centre for Rock Art Research and Management/Archaeology

Student(s) Samantha Nicole Harper

Thank you for submitting your Progress Report for the above project. The report is satisfactory and ethics approval for the project has been renewed.

You will receive a request for your next progress report approximately one month before the next renewal date of 21 March 2017.

If you have any queries, please contact the Human Ethics office at hum.ethics@uwa.edu.au

Please ensure that you quote the file reference – RA/41/6418 – and the associated project title in all future correspondence.

Yours sincerely,

Dr. Cassandra Li
Manager, Human Ethics
Our Ref: RA91/1419

29 March 2017

Professor Josephine McDonald
School of Social Sciences
M6DP M257

Dear Professor McDonald,

HUMAN RESEARCH ETHICS OFFICE – ETHICS APPROVAL RENEWED

Centre for Rock Art Research and Management; Archaeology

Thank you for submitting your Progress Report for the above project. The report is satisfactory and ethics approval for the project has been renewed.

You will receive a request for your next progress report approximately one month before the next renewal date of 27 March 2018.

If you have any queries, please contact the Human Ethics office at humanethics@uwa.edu.au.

Please ensure that you quote the file reference – RA91/1419 – and the associated project title in all future correspondence.

Yours sincerely,

Mark Davies
Manager, Human Ethics

Name Faculty / School Role
Professor Josephine McDonald School of Social Sciences Chief Investigator

Student(s): Samantha Harper - PhD

The University of Western Australia

335
18th November, 2013

UWA Human Research Ethics Committee
UWA
35 Stirling Highway WA 6009

To whom it may concern,

Consent to undertake PhD research of Port Hedland rock art sites

Marapikurrinya Consultants, as the registered Native Title claimants for Port Hedland, have been contacted by Sam Harper in relation to her proposed PhD fieldwork looking at rock art sites in our area.

Sam sent us a letter on the 9th of July 2013, has met with us in Port Hedland when she was here for other university business, and has followed up with phone calls in November 2013. She has discussed her proposed fieldwork, and the involvement and consultation with Marapikurrinya for this project.

Sam will continue to consult with Marapikurrinya via phone calls, meetings, and involvement in all stages of her research. She will be meeting with Marapikurrinya in the New Year (2014) to discuss the sites she wishes to investigate for her research, prior to her fieldwork. This will include assessing sites for any cultural restrictions. These potential sites have already been visited by Marapikurrinya representatives in 2013 with the Centre for Rock Art Research and Management (UWA), in relation to a Plan of Management for rock art sites in Port Hedland.

Marapikurrinya is happy for written information provided by Sam, including the Participation Information Form and Participant Consent Form to be provided in English, with simplified ‘Plain English’ versions of the documents also provided.

Marapikurrinya approves Sam’s proposed research to go ahead in light of her commitment to consultation with Marapikurrinya throughout her project.

Kind Regards,

Kerry Robinson
(for) Marapikurrinya Consultants

Date: 25/01/2014

KERRY ROBINSON
APPENDIX 3: RECORDING SHEET
<table>
<thead>
<tr>
<th>Site</th>
<th>Recorder:</th>
<th>Date:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motif ID</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Motif Class</td>
<td>Geometric</td>
<td>Geometric</td>
</tr>
<tr>
<td></td>
<td>Anthropomorphic</td>
<td>Anthropomorphic</td>
</tr>
<tr>
<td></td>
<td>Spooromorphic</td>
<td>Spooromorphic</td>
</tr>
<tr>
<td></td>
<td>Zoomorphic</td>
<td>Zoomorphic</td>
</tr>
<tr>
<td></td>
<td>Phytomorphic</td>
<td>Phytomorphic</td>
</tr>
<tr>
<td></td>
<td>Material Culture</td>
<td>Material Culture</td>
</tr>
<tr>
<td></td>
<td>Amorphous</td>
<td>Amorphous</td>
</tr>
<tr>
<td></td>
<td>Grinding Patch</td>
<td>Grinding Patch</td>
</tr>
</tbody>
</table>

| Motif Subject | |
| Position on slope | |
| Aspect (?) | |

| Dip | |
| Surface Texture | Smooth | Smooth | Smooth | Smooth |
| | Relatively Smooth | Relatively Smooth | Relatively Smooth | Relatively Smooth |
| | Rough | Rough | Rough | Rough |
| Surface Contour | Flat | Flat | Flat | Flat |
| | Undulating | Undulating | Undulating | Undulating |
| | Stepped | Stepped | Stepped | Stepped |
| | Irregular | Irregular | Irregular | Irregular |
| | Concave | Concave | Concave | Concave |
| | Convex | Convex | Convex | Convex |

| Rock Condition | Good | Good | Good | Good |
| | Exfoliated | Exfoliated | Exfoliated | Exfoliated |
| | Split/Cracked | Split/Cracked | Split/Cracked | Split/Cracked |
| | Weathered | Weathered | Weathered | Weathered |
| | Pitted | Pitted | Pitted | Pitted |
| | Damaged | Damaged | Damaged | Damaged |
| | Stained | Stained | Stained | Stained |

| Panel Size | |
| Motif Size (L,W) | |

| Motif Condition | |
| Technique | Engraved | Engraved | Engraved | Engraved |
| | Painted | Painted | Painted | Painted |
| | Abraded | Abraded | Abraded | Abraded |
| | Battered | Battered | Battered | Battered |
| | Pecked | Pecked | Pecked | Pecked |
| | Rubbed | Rubbed | Rubbed | Rubbed |
| | Stencil | Stencil | Stencil | Stencil |
| | Scratched | Scratched | Scratched | Scratched |
| | Pounded | Pounded | Pounded | Pounded |
| | Bruised | Bruised | Bruised | Bruised |
| | Incised | Incised | Incised | Incised |
| Form | Outline | Outline | Outline | Outline |
| | Linear | Linear | Linear | Linear |
| | Infill | Infill | Infill | Infill |
| | Intaglio | Intaglio | Intaglio | Intaglio |
| | Patterned | Patterned | Patterned | Patterned |

| Depth | Flat | Mod | Flat | Mod |
| | Shall | Deep | Shall | Deep |
| | Flat | Mod | Flat | Mod |
| | Shall | Deep | Shall | Deep |

| Superimposition | |
| Dating potential | |
# Appendix 4: Motif Definitions

## Amorphous

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
<th>Illustration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amorphous</td>
<td>Unidentifiable shape and form</td>
<td><img src="image1" alt="Amorphous Illustration" /></td>
</tr>
<tr>
<td>Pecking</td>
<td>Random pecking marks</td>
<td><img src="image2" alt="Pecking Illustration" /></td>
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</table>

## Anthropomorphic

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
<th>Illustration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arm</td>
<td>Human arm with hand, with and without elbow</td>
<td><img src="image3" alt="Arm Illustration" /></td>
</tr>
<tr>
<td>Circle Head</td>
<td>Stick figure anthropomorph with circular outline head</td>
<td><img src="image4" alt="Circle Head Illustration" /></td>
</tr>
<tr>
<td>Composite</td>
<td>Anthropomorph made of multiple motifs, includes human head, may include arms, legs or body, parts replaced with other motifs e.g. shield for body</td>
<td><img src="image5" alt="Composite Illustration" /></td>
</tr>
<tr>
<td>Head</td>
<td>Human head, no attached body</td>
<td><img src="image6" alt="Head Illustration" /></td>
</tr>
<tr>
<td>Infill</td>
<td>Infill form anthropomorph, various attributes</td>
<td><img src="image7" alt="Infill Illustration" /></td>
</tr>
<tr>
<td>Leg</td>
<td>Human leg, not attached to body, with foot, with and without knee</td>
<td><img src="image8" alt="Leg Illustration" /></td>
</tr>
<tr>
<td>Minyiburu</td>
<td>Specific anthropomorph type distinguished by U-Shaped body, frequently with akimbo arms, infill hands and feet, eyes and rayed headdress</td>
<td></td>
</tr>
<tr>
<td>-----------</td>
<td>--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>Murra</td>
<td>Specific anthropomorph type distinguished by parallel lines comprising body, arms and legs</td>
<td></td>
</tr>
<tr>
<td>Outline</td>
<td>Outline form, frequently lacking anatomical detail</td>
<td></td>
</tr>
<tr>
<td>Stick figure</td>
<td>Arms, body, legs, head all linear, equal width</td>
<td></td>
</tr>
<tr>
<td>Vulva</td>
<td>Female genitalia, oval bisected by inner pointed oval or line</td>
<td></td>
</tr>
</tbody>
</table>

**GEOMETRIC**

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
<th>Example Illustrations</th>
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<tr>
<td>Sun</td>
<td>Circle with rayed lines emerging off</td>
<td><img src="image" alt="Sun Illustration" /></td>
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<tr>
<td>Arc</td>
<td>Curved line</td>
<td><img src="image" alt="Arc Illustration" /></td>
</tr>
<tr>
<td>Arc angular</td>
<td>Curved line with bend</td>
<td><img src="image" alt="Arc Angular Illustration" /></td>
</tr>
<tr>
<td>Arc bisected</td>
<td>Curved line with bisecting line</td>
<td><img src="image" alt="Arc Bisected Illustration" /></td>
</tr>
<tr>
<td>Arc closed</td>
<td>Hairpin arc</td>
<td><img src="image" alt="Arc Closed Illustration" /></td>
</tr>
<tr>
<td>Arcs parallel</td>
<td>Parallel arcs</td>
<td><img src="image" alt="Arcs Parallel Illustration" /></td>
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<tr>
<td>Circle</td>
<td>Circle, infill or outline form</td>
<td><img src="image" alt="Circle Illustration" /></td>
</tr>
<tr>
<td><strong>Circle banded</strong></td>
<td><strong>Banded circle</strong></td>
<td><img src="image" alt="Banded Circle" /></td>
</tr>
<tr>
<td>------------------------</td>
<td>-------------------------</td>
<td>------------------------</td>
</tr>
<tr>
<td><strong>Circle bisected</strong></td>
<td><strong>Circle with bisected line</strong></td>
<td><img src="image" alt="Bisected Circle" /></td>
</tr>
<tr>
<td><strong>Concentric Circle/Oval</strong></td>
<td><strong>Series of nested circles or ovals</strong></td>
<td><img src="image" alt="Series of Circles" /></td>
</tr>
<tr>
<td><strong>Circle pointed</strong></td>
<td><strong>Pointed circle</strong></td>
<td><img src="image" alt="Pointed Circle" /></td>
</tr>
<tr>
<td><strong>Cross</strong></td>
<td><strong>Bisected pair of lines</strong></td>
<td><img src="image" alt="Bisected Lines" /></td>
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<tr>
<td><strong>CXNF</strong></td>
<td><strong>Comprises a combination of geometric shapes and forms</strong></td>
<td><img src="image" alt="CXNF" /></td>
</tr>
<tr>
<td><strong>Dots</strong></td>
<td><strong>Small infill circles</strong></td>
<td><img src="image" alt="Dots" /></td>
</tr>
<tr>
<td><strong>Fringe</strong></td>
<td><strong>Line with series of parallel perpendicular lines coming off</strong></td>
<td><img src="image" alt="Fringe" /></td>
</tr>
<tr>
<td><strong>Fringe handled</strong></td>
<td><strong>Fringe with additional line off opposite side</strong></td>
<td><img src="image" alt="Fringe with Additional Line" /></td>
</tr>
<tr>
<td><strong>Fringe Curved</strong></td>
<td><strong>Fringe where main line is arc</strong></td>
<td><img src="image" alt="Fringe with Arc" /></td>
</tr>
<tr>
<td><strong>Gourd</strong></td>
<td><strong>Irregular shape like butternut</strong></td>
<td><img src="image" alt="Gourd" /></td>
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<tr>
<td><strong>Grid</strong></td>
<td><strong>Series of intersecting parallel lines</strong></td>
<td><img src="image" alt="Grid" /></td>
</tr>
<tr>
<td><strong>Line</strong></td>
<td><strong>Straight line</strong></td>
<td><img src="image" alt="Line" /></td>
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<tr>
<td><strong>Linear design</strong></td>
<td><strong>Series of intersecting lines</strong></td>
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<td><strong>Line meandering</strong></td>
<td><strong>Wavy line</strong></td>
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<tr>
<td>Shape</td>
<td>Description</td>
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<tr>
<td>Lines parallel</td>
<td>Parallel lines</td>
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<tr>
<td>Lines parallel meandering</td>
<td>Parallel meandering lines</td>
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<tr>
<td>Oval</td>
<td>Elongated circle</td>
<td><img src="image" alt="elongated circle" /></td>
</tr>
<tr>
<td>Oval banded</td>
<td>Banded oval</td>
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<tr>
<td>Oval bisected</td>
<td>Oval with bisecting line</td>
<td><img src="image" alt="oval with bisecting line" /></td>
</tr>
<tr>
<td>Oval irregular</td>
<td>Asymmetric oval</td>
<td><img src="image" alt="asymmetric oval" /></td>
</tr>
<tr>
<td>Oval pointed</td>
<td>Pointed oval</td>
<td><img src="image" alt="pointed oval" /></td>
</tr>
<tr>
<td>Rayed line</td>
<td>Rayed lines from central point</td>
<td><img src="image" alt="rayed lines from central point" /></td>
</tr>
<tr>
<td>SNF</td>
<td>Combination of simple shapes</td>
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<tr>
<td>Spiral</td>
<td>Spiral</td>
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<tr>
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<td>Square</td>
<td><img src="image" alt="square" /></td>
</tr>
<tr>
<td>Square banded</td>
<td>Banded square</td>
<td><img src="image" alt="banded square" /></td>
</tr>
<tr>
<td>T</td>
<td>'T' shape</td>
<td><img src="image" alt="T shape" /></td>
</tr>
<tr>
<td>Triangle</td>
<td>Triangle</td>
<td><img src="image" alt="triangle" /></td>
</tr>
<tr>
<td>Trident</td>
<td>Trident shape</td>
<td><img src="image" alt="trident shape" /></td>
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<td>---------------</td>
</tr>
<tr>
<td>&quot;Y&quot; Shape</td>
<td>&quot;Y&quot; Shape</td>
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<tr>
<td>Zigzag parallel</td>
<td>Parallel zigzags</td>
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**Grinding Patch**

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<th>Description</th>
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<tbody>
<tr>
<td>Linear</td>
<td>Long grinding patch</td>
<td><img src="https://example.com/linear_patch.png" alt="" /></td>
</tr>
<tr>
<td>Linear/Round</td>
<td>Combination of linear and round patch</td>
<td><img src="https://example.com/linear_round_patch.png" alt="" /></td>
</tr>
<tr>
<td>Round</td>
<td>Circular grinding patch</td>
<td><img src="https://example.com/circular_patch.png" alt="" /></td>
</tr>
</tbody>
</table>

**Material Culture**

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
<th>Illustrations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Axe</td>
<td>Oval to pointed shape with handle attached</td>
<td><img src="https://example.com/axe.png" alt="" /></td>
</tr>
<tr>
<td>Basket</td>
<td>Round at one end, gridded, with a linear handle at opposite end</td>
<td><img src="https://example.com/basket.png" alt="" /></td>
</tr>
<tr>
<td>Type</td>
<td>Description</td>
<td>Example Illustrations</td>
</tr>
<tr>
<td>-----------------</td>
<td>-----------------------------------------------------------------------------</td>
<td>-----------------------</td>
</tr>
<tr>
<td>Boomerang</td>
<td>Arc shape, outline and infill, some with designs, varying morphologies, some symmetrical, some thicker at one end, bend at varying points along shaft</td>
<td><img src="image1" alt="Boomerang" /></td>
</tr>
<tr>
<td>Net</td>
<td>Gridded shape, rounded at one end, open at other</td>
<td><img src="image2" alt="Net" /></td>
</tr>
<tr>
<td>Rope</td>
<td>Meandering line, associated with other motifs to infer purpose</td>
<td><img src="image3" alt="Rope" /></td>
</tr>
<tr>
<td>Shield</td>
<td>Oval shape in various morphologies, from round and wide to long and thin, with and without design</td>
<td><img src="image4" alt="Shield" /></td>
</tr>
<tr>
<td>Shoe</td>
<td>Foot shaped oval, with various grids, sometimes including toes</td>
<td><img src="image5" alt="Shoe" /></td>
</tr>
<tr>
<td>Spear</td>
<td>Linear shaft with various arrangement of angled barbs, including X-shaped, at one end or continuing along shaft</td>
<td><img src="image6" alt="Spear" /></td>
</tr>
<tr>
<td>Spearthrower</td>
<td>Oval to parallel sided shape, with and without internal designs, triangular point on some ends, rounded narrow shape at other indicating handle</td>
<td><img src="image7" alt="Spearthrower" /></td>
</tr>
</tbody>
</table>

**PHYTOMORPHIC**

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
<th>Example Illustrations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fern</td>
<td>Central lines with angled lines off, in decreasing length</td>
<td><img src="image8" alt="Fern" /></td>
</tr>
</tbody>
</table>
## Tracks

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
<th>Example Illustrations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bird</td>
<td>V; three and four toed: bisected V shape, with and without line from base of bottom of V; outline, linear and infill forms</td>
<td><img src="image1" alt="Example Illustrations" /></td>
</tr>
<tr>
<td>Bird leg</td>
<td>Bird track attached to outline or infill tube</td>
<td><img src="image2" alt="Example Illustrations" /></td>
</tr>
<tr>
<td>Bird leg/s and eggs</td>
<td>Bird leg/s associated with cluster of circles</td>
<td><img src="image3" alt="Example Illustrations" /></td>
</tr>
<tr>
<td>Bird leg/s and vulva</td>
<td>Bird leg/s associated with vulva</td>
<td><img src="image4" alt="Example Illustrations" /></td>
</tr>
<tr>
<td>Dingo</td>
<td>Rounded four-toed track, circular shaped</td>
<td><img src="image5" alt="Example Illustrations" /></td>
</tr>
<tr>
<td>Insect</td>
<td>Central line, straight or meandering, with lines of dots on either side</td>
<td><img src="image6" alt="Example Illustrations" /></td>
</tr>
<tr>
<td>Lizard</td>
<td>Central line, straight or meandering, with dashes on either side</td>
<td><img src="image7" alt="Example Illustrations" /></td>
</tr>
<tr>
<td>Macropod</td>
<td>Range of styles, infill oval pairs, naturalistic tracks with long pointed central shape, with shorter angled pointed shapes on either side</td>
<td><img src="image8" alt="Example Illustrations" /></td>
</tr>
<tr>
<td>Macropod pentipedalling sitting</td>
<td>Back feet, hands or dots for hands, central line for tail, in various arrangements</td>
<td><img src="image9" alt="Example Illustrations" /></td>
</tr>
<tr>
<td>Turtle</td>
<td>Long narrow U shape, bisected by line</td>
<td><img src="image10" alt="Example Illustrations" /></td>
</tr>
<tr>
<td>Type</td>
<td>Description</td>
<td>Example Illustrations</td>
</tr>
<tr>
<td>------------</td>
<td>-----------------------------------------------------------------------------</td>
<td>-----------------------</td>
</tr>
<tr>
<td>Human foot</td>
<td>Infill or outline human footshape with varying numbers of toes</td>
<td><img src="image1.png" alt="Image" /></td>
</tr>
<tr>
<td>Human hand</td>
<td>Infill or outline human handshape</td>
<td><img src="image2.png" alt="Image" /></td>
</tr>
<tr>
<td>Sitting woman</td>
<td>Combination of vulva, footprints and infill ovals</td>
<td><img src="image3.png" alt="Image" /></td>
</tr>
</tbody>
</table>

**ZOOMORPH**

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
<th>Example Illustrations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bird</td>
<td>Figurative bird, or collection of bird feet, legs, and circle indicating a body</td>
<td><img src="image4.png" alt="Image" /></td>
</tr>
<tr>
<td>Crab</td>
<td>Oval body, legs, and pincers</td>
<td><img src="image5.png" alt="Image" /></td>
</tr>
<tr>
<td>Dolphin</td>
<td>Figurative marine motif with narrow pointed snout and fin</td>
<td><img src="image6.png" alt="Image" /></td>
</tr>
<tr>
<td>Dugong</td>
<td>Figurative marine motif, large body in proportion to fins, flat head</td>
<td><img src="image7.png" alt="Image" /></td>
</tr>
<tr>
<td>Fish/Marine</td>
<td>Marine motif with tail and/or fins</td>
<td><img src="image8.png" alt="Image" /></td>
</tr>
<tr>
<td>Fish tail</td>
<td>Fish tail with no associated body</td>
<td><img src="image9.png" alt="Image" /></td>
</tr>
<tr>
<td>Frog</td>
<td>Oval body, legs with chunky feet</td>
<td><img src="image10.png" alt="Image" /></td>
</tr>
<tr>
<td>Jellyfish</td>
<td>Dome shaped body and linear tentacles off</td>
<td><img src="image11.png" alt="Image" /></td>
</tr>
<tr>
<td>Quadruped</td>
<td>Four legs off body, with head shape indicated</td>
<td><img src="image12.png" alt="Image" /></td>
</tr>
<tr>
<td>Seal</td>
<td>Head, forked tail, and rounded body wider at top end</td>
<td><img src="image13.png" alt="Image" /></td>
</tr>
<tr>
<td></td>
<td>Description</td>
<td>Image</td>
</tr>
<tr>
<td>---------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>-------</td>
</tr>
<tr>
<td>Shell</td>
<td>Triangular (i.e. Terebralia) and bisected oval shape (i.e. bivalve)</td>
<td></td>
</tr>
<tr>
<td>Snake</td>
<td>Meandering shaped body line, infill or outline, widens for head – round or diamond shaped</td>
<td></td>
</tr>
<tr>
<td>Squid</td>
<td>Pointed oval shape, flat at other end, meandering linear lines off this flat end suggesting tentacles</td>
<td></td>
</tr>
<tr>
<td>Stingray</td>
<td>Multiple morphologies from circular to devil-ray anatomically, lines indicating tails, various internal patterning and anatomical features e.g. beaks, claspers</td>
<td></td>
</tr>
<tr>
<td>Turtle</td>
<td>Circular to oval carapaces with and without designs, rounded to pointed shapes indicating flippers, heads indicated by rounded shapes, linear to infill and outline tail shapes</td>
<td></td>
</tr>
<tr>
<td>Turtle shell</td>
<td>Circle to ovals with distinctive carapace patterns seen on turtles</td>
<td></td>
</tr>
<tr>
<td>Whale</td>
<td>Marine motif, flat head, elongated, with and without patterning, small flippers compared to body size</td>
<td></td>
</tr>
</tbody>
</table>